310 CMR 22.00 DRINKING WATER REGULATION
2006 Proposed Revisions
(Minor Corrections)

Amend 310 CMR 22.00 as follows:

22.01: Purpose and Authority
22.02: Definitions
22.03: Compliance
22.04: Construction, Operation and Maintenance of Public Water Systems
22.05: Maximum Microbiological Contaminant Levels, Monitoring Requirements and Analytical Methods
22.06: Inorganic Chemical Maximum Contaminant Levels, Monitoring Requirements and Analytical Methods
22.06A: Special Monitoring for Sodium, Reporting and Analytical Methods and Frequency
22.06B: Control of Lead and Copper in Drinking Water
22.06C: Compliance With Secondary Maximum Contaminant Level and Public Notification for Fluoride
22.06D: Reserved~~– Special Monitoring for Perchlorate~~
22.07: Reserved~~Maximum Trihalomethanes Contaminant Levels, Monitoring Requirements and Analytical Methods~~
22.07A: Synthetic Organic Chemicals (SOC) Sampling and Analytical Requirements
22.07B: Maximum Contaminant Levels (MCLs) for Volatile Organic Compounds (VOC)
22.07C: Unregulated Inorganic and Organic Chemicals Special Monitoring
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22.08: Maximum Turbidity Contaminant Levels, Monitoring Requirements and Analytical Methods for Unfiltered Systems and for Filtered Systems not in Compliance with 310 CMR 22.20A
22.09: Reserved~~Maximum Radionuclide Contaminant Levels, Monitoring Requirements and Analytical Methods~~
22.09A: Maximum Radionuclide Contaminant Levels, Monitoring Requirements and Analytical Methods effective as of December 8, 2003
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22.11A: Laboratory Certification
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22.23: Use of Non-Centralized Treatment Devices and Bottled Water
22.24: Sale, Transfer of Property Interest, or Change in Use of Water Supply Land
22.25: Abandonment of Water Supply Sources

Amend Section 22.01 as follows:

22.01: Purpose and Authority

(1) ~~(1)~~ 310 CMR 22.00 is intended to promote the public health and general welfare by preventing the pollution and securing the sanitary protection of all such waters used as sources of water supply and ensuring that public water systems in Massachusetts provide to the users thereof water that is safe, fit and pure to drink.

(2) 310 CMR 22.00 is promulgated pursuant to the authority conferred by M.G.L. c. 21A, § 2(28), and M.G.L. c. 111, § 160. Pursuant to M.G.L. c. 30A, §§ 1(5), 2 and 3, 310 CMR 22.00 is promulgated to set forth those standards and requirements of general application and future effect which shall be used to implement, interpret and enforce M.G.L. c. 40, §§ 15B, 38, 39B, 39C, 40, 41, and 41A; M.G.L. c. 111, §§ 2C, 5E, 5F, 5G, 17, 143, 159, 160A, 160B, 162 and 165; M.G.L. c. 114, §§ 35 and 36; M.G.L. c. 140, §§ 32B and 32H; and M.G.L. c. 165, §§ 4B and 6.

a) The Department affirms its authority to determine compliance or initiate enforcement actions related to 310 CMR 22.00 based upon analytical results and other information compiled by its sanctioned representatives and agencies.
(b) 310 CMR 22.22 is promulgated pursuant to the authority conferred by M.G.L. c. 111, §§160 and 160A.

(~~2~~3) Effective Dates.
(a) Except as provided in 310 CMR 22.01(2), 310 CMR 22.00 shall take effect on June 24, 1977. Rules and Regulations For the Purpose of Preventing The Pollution And Securing The Sanitary Protection of Certain Waters Used As Sources of Public Water Supply, approved and adopted by the Department of Public Health on October 11, 1960 and filed with the Secretary of the Commonwealth on June 1, 1961, are repealed as of the effective date of 310 CMR 22.00.
(b) Except for 310 CMR 22.06(2)(c), the effective date for 310 CMR 22.06, 22.07, 22.07A is January 1, 1993.
(c) The effective date for 310 CMR 22.07B(1)(a)(1) through (a)(8) is January 9, 1989.
(d) The effective date for 310 CMR 22.07B(1)(a)(9) through (a)(18) and of 310 CMR 22.07A(1)(a)(1) through (c)(18) is July 30. 1992.
~~(e) The maximum contaminant level for lead shall remain effective until December 7, 1992; the maximum contaminant level for barium shall remain effective until January 1, 1993.~~
(e) Reserved
(f) The effective date for 310 CMR 22.06(2)(a) is October 2, 1987 and for 310 CMR 22.06 (2)(b) and 310 CMR 22.06(2)(d) through 310 CMR 22.06(2)(k) is July 30, 1992.
(g) 310 CMR 22.05 became effective January 1, 1991.
(h) The effective date for 310 CMR 22.06(2)(l) through (p), 22.07A(1)(t) through (hh) and 22.07B(1)(s) through (v) is January 17, 1994
(i) The effective date for 310 CMR 22.11B is July 1, 1995.

(j) The effective date for 310 CMR 22.16A is the date of promulgation.
(k) The effective date for 310 CMR 22.07C is the date of promulgation.
(l) The effective date for 310 CMR 22.07E and 310 CMR 22.20D is January 1, 2002.
(m) The effective date for 310 CMR 22.20E is the date of promulgation.
(n) The effective date for 310 CMR 22.20F is January 1, 2005.
(o) The effective date of 310 CMR 22.09A is December 8, 2003.
(p) The arsenic maximum contaminant level (MCL) listed in 310 CMR 22.06(2)(c) is effective for the purpose of compliance on January 23, 2006. Requirements relating to arsenic set forth in 310 CMR 22.06(2), 310 CMR 22.06(4), 310 CMR 22.06(15), 310 CMR 22.06(16), and 310 CMR 22.06(17), are effective for the purpose of compliance on January 23, 2006. The Consumer Confidence Rule reporting requirements relating to arsenic listed in 310 CMR 22.16A(10) are effective for the purpose of compliance on March 23, 2001.

Amend Section 22.02 as follows:

22.02 Definitions

Laboratory Analyst means a person who is qualified to perform tests in specified disciplines or categories.

Laboratory Director means the person who has administrative and legal responsibility for the operation of the laboratory.

Laboratory Supervisor/Consultant means a person with management and technical responsibility, who exercises supervision over technical personnel, evaluates the quality of analytical methods, performs tests requiring special scientific skills and is responsible for the accuracy and reporting of results.

Large Water System, for the purpose of 310 CMR 22.06(B) means a water system that serves more than 50,000 persons.

Lead Service Line means a service line made of lead which connects the water main to the building inlet and any lead pigtail, gooseneck or other fitting that is connected to such lead line.

Legionella means a genus of bacteria, some species of which have caused a type of pneumonia called Legionnaires Disease.

Man-made Beta Particle and Photon Emitters means all radionuclides emitting beta particles and/or photons listed in Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure, NBS Handbook 69, except the daughter products of thorium-232, uranium-235 and uranium-238.

Maximum Contaminant Level or MCL means the maximum permissible level of a contaminant in water which is delivered to any user of a public water system. The definition of Maximum Contaminant Level for the purpose of the consumer confidence report is contained in 310 CMR 22.16A(4)(c)2.

Maximum Contaminant Level Goal or MCLG: for the purpose of 310 CMR 22.16A(4)(C)1. means the level of a contaminant in drinking water at or below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum Residual Disinfectant Level (MRDL) means a level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects. MRDLs are enforceable in the same manner as maximum contaminant levels under 310 CMR 22.00.

Maximum Residual Disinfectant Level Goal (MRDLG) means the maximum level of a disinfectant added for water treatment at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. MRDLGs are nonenforceable health goals and do not reflect the benefit of the addition of the chemical for control of waterborne microbial contaminants.

Maximum Total Trihalomethane Potential means the maximum concentration of total trihalomethanes produced in a given water containing a disinfectant residual after seven days at a temperature of 25°C or above.

Medium-size Water System, for the purpose of 310 CMR 22.06B means a water system that serves greater than 3,300 and less than or equal to 50,000 persons.

Near the First Service Connection means at one of the 20% of all service connections in the entire system that are nearest the water supply treatment facility, as measured by water transport time within the distribution system.

New Source means any existing, proposed, or expanded use of a water source in a public water system that has not met the requirements of guidelines and regulations utilized by the Drinking Water Program.

New Source Approval Process means the step-by-step process utilized by the Department's Drinking Water Program culminating in the development of water for a public water system.

Nonzoning Controls means by-laws, ordinances, rules and regulations, other than zoning controls, adopted in accordance with the constitutional and statutory powers of cities and towns to protect the health, safety and general welfare of their present and future inhabitants.

On-line means a well, wellfield or surface water source from which water currently is being pumped or drawn for use in a public water system.

Optimal Corrosion Control Treatment means, for the purpose of 310 CMR 22.06B only, the corrosion control treatment that minimizes the lead and copper concentrations at users' taps while insuring that the treatment does not cause the water system to violate any national primary drinking water regulations.

Performance Evaluation Sample means a reference sample provided to a laboratory for the purpose of demonstrating that the laboratory can successfully analyze the sample within limits of performance set by the Department.

Person means an individual, corporation, company, association, trust, partnership, the Commonwealth, a municipality, district or other subdivision or body politic of the Commonwealth, any department, agency, or instrumentality of the United States, except that nothing herein shall be construed to refer to or include any American Indian tribe, or the United States Secretary of the Interior in his capacity as trustee of Indian lands.

Picocurie (pCi) means that quantity of radioactive material producing 2.22 nuclear transformations per minute.

Point of Disinfectant Application is the point where the disinfectant is applied and water downstream of that point is not subject to recontamination by surface water runoff.

Point-of-entry Treatment Device (POE) means a device installed to treat the water entering a house or building or portion of such for the purpose of reducing contaminants in the water distributed throughout the house or building or portion of such.

Point-of-use Treatment Device (POU) means a treatment device installed on a single faucet or spigot used for the purpose of reducing contaminants in drinking water at that one faucet or spigot.

Primary Operator means a person who is certified by the Board of Certification of Drinking Water Supply Facilities and has a grade certificate equal to the class of the corresponding facility at which he or she is employed. The Primary Operator shall be the individual who has direct supervision and responsibility for charge of the operation of a facility such as the superintendent or chief plant operator who has active field supervision of the operation of the facility or who is required in the performance of their normal duties to give responsible, technical advice and supervision of the technical aspects rather than only general administrative supervision of the treatment and/or distribution of the water supply and spends their working hours at the treatment facility or performing distribution system duties and is knowledgeable of the Massachusetts Drinking Water Regulations, guidelines and policies. The Primary Operator of the facility shall hold a "Full Operator" status and cannot hold an "Operator-in-Training" certificate as defined in 236 CMR 4.05.

Public Water System means a system for the provision to the public of water for human consumption, through pipes or other constructed conveyances, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year. Such term includes (1) any collection, treatment, storage, and distribution facilities under control of the operator of such a system and used primarily in connection with such system, and (2) any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. The Department may presume that a system is a public water system as defined herein based on the average number of persons using a facility served by the system or on the number of bedrooms in a residential home or facility. ~~Any public water system that has one r or more~~ The Department reserves the right to evaluate and

determine whether two or more wells located on commonly owned property, ~~including wells located on any contiguous property determined by the Department to be held in same common ownership,~~ that individually may serve less than 25 people, but collectively serve more than 25 people for more than 60 days of the year should be regulated ~~constitutes~~ as a public water system, taking into account the risk to public health. ~~under this definition.~~ A public water system includes a "community water system" or a "non-community water system".

(a) Community Water System means a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

(b) Non-community Water System means a public water system that is not a community water system.

1. Non-transient Non-community Water System or "NTNC" means a public water system that is not a community water system and that has at least 15 service connections or regularly serves at least 25 of the same persons or more approximately four or more hours per day, four or more days per week, more than six months or 180 days per year, such as a workplace providing water to its employees.

2. Transient Non-community Water System or TNC means a public water system that is not a community water system or a non-transient non-community water system but is a public water system which has at least 15 service connections or serves water to 25 different persons at least 60 days of the year. Some examples of these types of systems are: restaurants, motels, camp grounds, parks, golf courses, ski areas and community centers.

Amend Section 22.04 as follows:

22.04: Construction, Operation and Maintenance of Public Water Systems

(8) New Product or Technology.

(a) No supplier of water shall add, install or use any chemicals, drinking water additives, or treatment devices or equipment that come into direct contact with drinking water, unless such devices or equipment have received the prior written approval of the Department.

(b) To obtain the Department's approval of a new product (e.g., additives, coatings) ~~and placement on the new technology approval list,~~ a manufacturer shall demonstrate that the product ~~or technology:~~

1.conforms to the applicable American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 60 or 61; or ~~to applicable~~ Underwriter Laboratory (UL) standards~~;~~ or the performance of the technology has been verified by Environmental Technology Verification (ETV) ~~standards,~~; and

2. was approved by the Environmental Protection Agency (EPA) prior to April 1990 and conforms to the standards of the American Water Works Association (AWWA). ~~; or~~

~~3. has been field tested by an independent testing laboratory to the Department's satisfaction; or~~

~~4. has performed to the Department's satisfaction during a Department approved pilot study.~~

(c) To obtain the Department's approval of a major new technology system, a manufacturer shall demonstrate that:

1.The major technology has been approved and used successfully in the United States for at least 5 years.. In addition, such major new technology must have been approved and used successfully in three states for at least two (2) years. One of the three states must either be a New England state or New York state or another state determined by the

Department to have similar environmental conditions, and the other two states must be primacy states.

2. If a technology does not meet the requirements of 310 CMR 22.04(8)(c)1, then the technology must be piloted in Massachusetts in accordance to 310 CMR 22.04(9).

3. The technology received a favorable review from ETV, UL, ANSI/NSF or AWWA.

~~—~~(d) If the technology is a vending machine, then National Automatic Merchandizing Association (NAMA) certification shall be required to obtain the Department's approval.-

(e) If the technology is a POU/POE device it shall conform to the requirements of 310 CMR 22.23.

~~(c)~~(f) Persons seeking to have a product or technology listed are directed to follow the procedures set forth in the Drinking Water Program's policy entitled: "New Product or Technology Review Policy " DWP Policy No. 89-01, a copy of which is available from the Drinking Water Program. The Department may revoke its approval of a product or technology if it determines that the product or technology is defective or performs inadequately in the field.

(g)~~(d)~~For products, i~~I~~f the drinking water chemicals or coatings have NSF certification, a NSF certification shall also be required of the original producer of the product. Repackers of chemicals are not required to be formally certified, but shall self-certify to the Department that the cleanliness of their procedures and purity of the resultant product is equivalent to the standards applicable to the original manufacturer. Any local reformulation of chemical requires certification in accordance with NSF 60.

(h)~~(e)~~ Any public or private entity providing the testing and certification described in 22.04(6)(b) for other parties shall be certified by the American National Standards Institute (ANSI).

Amend Section 22.05 as follows:

22.05: Maximum Microbiological Contaminant Levels, Monitoring Requirements and Analytical Methods

(1) Routine Coliform Monitoring.

(a) Each supplier of water shall collect total coliform samples at sites which are representative of water throughout the distribution system, at the entry point to the distribution system, and at storage facilities as determined by the Department. A raw water source sample shall be collected monthly if the water at the entry point to the distribution system is not representative of the source. All samples must be taken at sites according to a written sample site plan unless otherwise authorized by the Department in writing. These plans are subject to review, revision and approval by the Department. Systems that do not ~~treat~~ provide any treatment of their sources and are under 3,300 population are exempt from the raw water-sampling requirement. A total coliform positive raw water-sample shall not trigger the requirements of 310 CMR 22.05(2).

(6) Analytical Methodology.

(a) The standard sample volume required for total coliform analysis, regardless of analytical method used, is 100 ml. Sample should be tested within two hours of receipt in the laboratory. However, the time from sample collection to initiation of analysis shall not exceed 30 hours. Samples should be kept ~~at~~ below 10°C during transport or shipping to the laboratory.

(b) Public water systems need only determine the presence or absence of total coliform; a

determination of total coliform density is not required.

(c) Public water systems must conduct total coliform analyses in accordance with one of the following analytical methods set forth in 310 CMR 22.05(6)(c)1. through 310 CMR 22.05(6)(c)~~7~~ 10. These methods are contained in the 18th edition (1992), 19th edition (1995) or 20th edition (1998) of Standard Methods for the Examination of Water And Wastewater, 1992, American Public Health Association, 1015 Fifteenth Street NW., Washington, DC 20005. The cited methods in any of these editions may be used.

1. Total Coliform Fermentation Technique (9221A, B). Lactose broth, as commercially available, may be used in lieu of laurel tryptose broth, if the system conducts at least 25 parallel tests between this medium and laurel tryptose broth using the water normally tested, and this comparison demonstrates that the false-positive rate for total coliform, using lactose broth, is less than 10%. If inverted tubes are used to detect gas production, the media should cover these tubes at least ½ to $^{2}/_{3}$ after the sample is added. No requirement exists to run the completed phase on 10% of all total coliform-positive confirmed tubes.
2. Total Coliform Membrane Filter (MF) Technique (9222 A, B, C).
3. Presence-Absence (P-A) Coliform Test.(9221D) No requirement exists to run the completed phase on 10% of all total coliform-positive confirmed tubes. Six-times formulation strength may be used if the medium is filter-sterilized rather than autoclaved.
4. ONPG-MUG Test (9223). The ONPG-MUG Test is also known as the Autoanalysis ~~Colilert~~ Collect System.
5. Colisure Test. The Colisure Test must be incubated for 28 hours before examining the results. If an examination of the results at 28 hours is not convenient, then results may be examined at any time between 28 hours and 48 hours. A description of the Colisure Test 8th edition February 28, 1999 may be obtained from IDEXX Laboratories Inc., One IDEXX Drive, Westbrook, Maine 04092. The Colisure Test may be read after an incubation time of 24 hours.
6. E*Colite® Test. A description of the E*Colite® Test "Presence/A~~a~~bsence for Coliforms and E.~~ C~~coli in Water." December 21, 1997, is available from Charm Science Inc. 36 Franklin Street, Malden, MA 02148.
7. M-ColiBlue 24® Test. A description of the m-ColiBlue 24® T~~t~~est, August 17, 1999, is available from the Hach Company 100 Dayton Avenue, Ames, IA 50010.
8. Readycult®Coliforms 100 Presence/Absence Test. The Readycult® Coliforms 100 Presence/Absence Test is described in the document, "Readycult® Coliforms 100 Presence/Absence Test for Detection and Identification of Coliform Bacteria and *Escherichia coli* in Finished Waters". November 2000, Version 1.0, available from EM Science (an affiliate of Merck KGgA, Darmstadt Germany).
9. Membrane Filter Technique using Chromocult®Coliform Agar. A description of Membrane Filter Technique using Chromocult®Coliform Agar is in the document, "Chromocult® Coliform Agar Presence/Absence Membrane Filter Test Method for Detection and Identification of Coliform Bacteria and *Escherichia Coli* in Finished Waters", November 2000, Version 1.0, available from EM Science (an affiliate of Merck KGgA, Darmstadt Germany).
10. Colitag®Test for the determination of the presence/absence of total coliforms and E. Coli is described in "Colitag®Product as a test for Detection and identification of Coliforms and E.Coli Bacteria in Drinking Water and Source Water as Required in National Primary Drinking Water Regulations," August 2001, available from CPI International, Inc.

Amend Section 22.06 as follows:

22.06: Inorganic Chemical Maximum Contaminant Levels, Monitoring Requirements and Analytical Methods

(6) Sampling Frequency for IOCs: The frequency of monitoring conducted to determine compliance with the maximum contaminant levels in 310 CMR 22.06(2) for antimony, arsenic, beryllium, barium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium and thallium shall be as follows:

(a) IOCs Sampling Frequency: Groundwater systems shall take one sample at each sampling point once every three years. Surface water systems (or combined surface/ground) shall take one sample annually at each sampling point.

(b) IOCs Sampling Waiver: The system may apply to the Department for a waiver from the monitoring frequencies specified in 310 CMR 22.06(6)(a).

(c) IOC Sampling During a Waiver: A condition of the waiver shall require that a system shall take a minimum of one sample while the waiver is effective. The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

(d) Basis of an IOC Waiver & Grandfathered Data: A waiver may be granted by the Department provided the surface water systems have monitored annually for at least three years and groundwater systems have conducted a minimum of three rounds of monitoring. (Analytical monitoring results must have been representative of all sources at the time of sampling.) Both surface and groundwater systems shall demonstrate that all previous analytical results were less than the maximum contaminant level. Systems that use a new water source are not eligible for a waiver until three rounds of monitoring from the new source have been completed.

(15) Analytical and Sampling Methods for Inorganics:

(a) Analytical Methods for IOCs: Analysis for the listed inorganic contaminants shall be conducted using the following methods:

INORGANIC CONTAMINANTS ANALYTICAL METHODS

		Reference (Method Number)			
Contaminant	Methodology[13]	EPA	ASTM[3]	SM[4]	Other
Antimony	Atomic Absorption: Furnace			3113B	
	Atomic Absorption: platform	[2]200.9			
	ICP-Mass Spectrometry	[2]200.8			
	Hydride-Atomic Absorption		D-3697-92		
Arsenic[14]	Atomic Absorption: Furnace		D2972-97C	3113B	
	Atomic Absorption; Hydride		D-2972-97B	3114B	
	Inductively Coupled Plasma[15]	[2]200.7		3120B[15]	
	ICP-Mass Spectrometry	[2]200.8			
	Atomic Absorption; Platform	[2]200.9			
Asbestos	Transmission Electron Microscopy	[9]100.1	--	--	
	Transmission Electron Microscopy	[10]100.2			
Barium	Atomic Absorption; Furnace		--	3113B	--
	Atomic Absorption; Direct		--	3111D	--
	Inductively Coupled Plasma	[2]200.7	--	3120B	--
	ICP-Mass Spectrometry	[2]200.8			

Beryllium	Atomic Absorption; Furnace		D-3645-93B	3113B	
	Atomic Absorption; Platform	[2]200.9			
	Inductively Coupled Plasma	[2]200.7		3120B	
	ICP-Mass Spectrometry	[2]200.8			
Cadmium	Atomic absorption; Furnace		--	3113B	--
	Inductively-coupled Plasma	[2]200.7	--	--	--
	ICP-Mass Spectrometry	[2]200.8			
	Atomic Absorption; Platform	[2]200.9			
Chromium	Atomic absorption; Furnace		--	3113B	--
	Inductively Coupled Plasma	[2]200.7	--	3120B	--
	ICP-Mass Spectrometry	[2]200.8			
	Atomic Absorption; Platform	[2]200.9			

INORGANIC CONTAMINANTS ANALYTICAL METHODS (continued)

		Reference (Method Number)			
Contaminant	Methodology[13]	EPA	ASTM[3]	SM[4]	Other
Cyanide	Manual Distillation		D2036-98A	4500-CN-C	
	Manual Distillation followed by: Spectrophotometric, Amenable		D2036-96B	4500-CN-G	
	Manual Distillation followed by: Spectrophotometric, Manual		D2036-98A	4500-CN-E	I-3300-85[5]
	Semi-automated	[6]335.4			
	Selective Electrode			4500-CN-F	
Mercury	Manual cold vapor	[2]245.1	D3223-97	3112B	--
	Automated cold vapor	[1]245.2	--	--	--
	ICP-Mass Spectrometry	[2]200.8			
Nickel	Atomic Absorption: Furnace			3113B	
	Atomic Absorption: Platform	[2]200.9			
	Atomic Absorption Direct			3111B	
	Inductively Coupled Plasma	[2]200.7		3120B	
	ICP-Mass Spectrometry	[2]200.8			
Nitrate	Manual cadmium reduction		D3867-90B	4500-NO_3-E	--
		--	--	--	
	Automated cadmium reduction	[6]353.2	D3867-90A	4500-NO_3-F	--
	Ion selective electrode	--	--	4500-NO_3-D	601[7]
	Ion chromatography	[6]300.0	D4327-97	4110B	B-1011[8]
Nitrite	Spectrophotometric		--	4500-NO_2-B	
	Automated cadmium reduction	[6]353.2	D3867-90A	4500-NO_3-F	--
	Manual cadmium reduction		D3867-90B	4500-NO_3-E	--
	Ion chromatography	[6]300.0	D4327-97	4110B	B-1011[8]
Selenium	Hydride-Atomic absorption;		D3859-98A	3114B	
	Atomic Absorption: Furnace		D3859-98B	3113B	

	ICP-Mass Spectrometry	[2]200.8
	Atomic Absorption; Platform	[2]200.9
Thallium	Atomic absorption; Platform	[2]200.9
	ICP-Mass Spectrometry	[2]200.8

The procedures shall be done in accordance with the documents listed below. The incorporation by reference of the following documents listed in footnotes 1-11 and 15 was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at 900-426-4791. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street, SW., Washington, DC 20460 (Telephone 202-260-3027); or at the Office of Federal Register, 800 North Capital Street, NW., Suite 700, Washington, DC.

[1] - "Methods of Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983. Available at NTIS, PB84-128677.

[2] - "Methods for the Determination of Metals in Environmental Samples - Supplement I", EPA-600/R-94/111, May 1994. Available at NTIS, PB 95-125472.

[3] - Annual Book of ASTM Standards, 1994 , 1996, or 1999 Vols. 11.01 and 11.02, American Society for Testing and Materials. The previous versions of D1688-95A, D1688-95C (copper), D3559-95D (lead), D1293-95 (pH), D1125-95A, (conductivity) and D859-94 (silica) are also approved. These previous versions D1688-90A, C; D3559-90D, D1293-84, D1125-91A and D859-88, respectively are located in the Annual Book of ASTM Standards, 1994, Vols. 11.01. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

[4] – 18th, 19th, and 20th edition of "Standard Methods for the Examination of Water and Wastewater", 18th (1982), 19th (1995), and 20th (1998) editions, American Public Health Association; either edition may be used. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street NW, Washington, DC 20005. The cited methods published in any of these three editions may be used, except that the versions of 3111B, 3111D, 3113B and 3114B in the 20th edition may not be used.

[5] - Method I-2601-90, "Methods for Analysis by the U.S. Geological Survey National Water Quality Laboratory – Determination of Inorganic and Organic Constituents in Water and Fluvial Sediments", Open File Report 93-125, 1993; For Methods I-1030-85; I-1601-85; I-1700-85; I-2598-85, I-2700-85; and I-3300-85 See "Techniques of Water Resources Investigation of the U.S. Geological Survey", Book 5, Chapter A-1, 3rd edition, 1989; Available from Information Services, U.S. Geological Survey, Federal Center, Box 25286, Denver, CO 80225-0425.
[6] - "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA 600/R-93/100, August 1993. Available at NTIS, PB94-120821.
[7] – The procedure shall be done in accordance with Technical Bulletin 601 "Standard Method of Test for Nitrate in Drinking Water", July 1994, PN 221890-001, Analytical Technology, Inc. Copies may be obtained from ATI Orion, 529 Main Street, Boston, MA 02129.
[8] – Method B-1011, "Standard Method of Test for Nitrate in Drinking Water", July 1994, PN 221890-001, Analytical Technology, Inc. Copies may be obtained from ATI Orion, 529 Main Street, Boston, MA 02129.
[9] – Method 100.1, "Analytical Methods for Determination of Asbestos Fibers in Water", EPA/600/4-83/043, September 1983, Available at NTIS, PB83-206471.
[10] – 10 Method 100.2, "Determination of Asbestos Structures Over 10 μm in Length in Drinking Water," EPA/600/R-94/134, June 1994. Available at NTIS, PB94-201902.
[11] – Industrial Method No. 129-71W, "Fluoride in Water and Wastewater", December 1972, and Method No. 380-75WE, "Fluoride in Water and Wastewater", February 1976, Technicon Industrial Systems. Copies may be obtained from Bran & Luebbe, 1025 Busch Parkway, Buffalo Grove, IL 60089.
[12] – Unfiltered, no digestion or hydrolosis.
[13] – Because MDLs reported in EPA Methods 200.7 and 200.9 were determined using a 2X preconcentration step during sample digestion, MDLs determined when samples are analyzed by direct analysis (i.e. no sample digestion) will be higher. For direct analysis of cadmium and arsenic by Method 200.7, and arsenic by Method 3120B sample preconcentration using pneumatic nebulization may be required to achieve lower detection limits. Preconcentration may also be required for direct analysis of antimony, lead, and thallium by Method 200.9; antimony and lead by Method 3113B; and lead by Method D3559-90D unless multiple in-furnace depositions are made.
[14] – If ultrasonic nebulization is used in the determination of arsenic by Methods 200.7, 200.8, or SM 3120 B, the arsenic must be in the pentavalent state to provide uniform signal response. For methods 200.7 and 3120B, both samples and standards must be diluted in the same mixed acid matrix concentration of nitric and hydrochloric acid with the addition of 100 μL of 30% hydrogen peroxide per 100 ml of sodium hypochlorite. For direct analysis of arsenic with the Method 200.8 using ultrasonic nebulization, samples must contain 1 mg/L of sodium hypochlorite.
[15] – After January 23, 2006 analytical methods using the ICP-AES technology, may not be used because the detection limits for these methods are 0.008 mg/L or higher. This restriction means that the two ICP-AES methods (EPA Method 200.7 and SM 3120 B) approved for use for the MCL of 0.05 mg/L may not be used for compliance determinations for the revised MCL of 0.01 mg/L. However, prior to January 23, 2005~~6~~ systems may have compliance samples analyzed with these less sensitive methods.

(16) BATs for IOCs: The following are the best technology, treatment technique, or other means available for achieving compliance with the maximum contaminant level for inorganic contaminants identified in 310 CMR 22.06(2) except fluoride and arsenic:

BAT FOR INORGANIC CONTAMINANTS LISTED IN 310 CMR 22.06(2)

CHEMICAL NAME	BAT(s)
Antimony	2,7

Arsenic	1,2,5,6,7,9,12[5]
Asbestos	2,3,8
Barium	5,6,7,9
Beryllium	1,2,5,6,7
Cadmium	2,5,6,7
Chromium	2,5,6[2],7
Cyanide	5,7,~~10~~13
Mercury	2[1],4,6[1],7[1]
Nickel	5,6,7
Nitrate	5,7,9
Nitrite	5,7
Selenium	1,2[3],6,7,9
Thallium	1,5

Key to BATs in Table
1 = Activated Alumina
2 = Coagulation/Filtration (Not BAT for Systems <500 service connections)
3 = Direct and Diatomite Filtration
4 = Granular Activated Carbon
5 = Ion Exchange
6 = Lime Softening (not BAT for systems <500 service connections)
7 = Reverse Osmosis
8 = Corrosion Control
9 = Electrodialysis
10 = Chlorine
11 = Ultraviolet
12 = Oxidation/Filtration
13 = Alkaline Chlorination

[1]BAT only if influent Hg concentrations ≤10 µg/l.
[2]BAT for Chromium III only
[3]BAT for Selenium IV only
[4]BAT for Arsenic V. Pre-oxidation may be required to convert Arsenic III to Arsenic V.
[5]To obtain high removals; iron to arsenic ratio must be at least 20.1.

Amend Section 22.06B as follows:

22.06B: Control of Lead and Copper in Drinking Water

(7) Monitoring Requirements for Lead and Copper in Tap Water.

(a) Sample Site Location.

1. By the applicable date for commencement of monitoring under 310 CMR 22.06B(7)(d)1., each water system shall complete a materials evaluation of its distribution system in order to identify a pool of targeted sampling sites that meets the requirements of 310 CMR 22.06B(7), and which is sufficiently large to ensure that the water system can collect the number of lead and copper tap samples required in 310 CMR 22.06B(7)(c). All sites from which first draw samples are collected shall be selected from this pool of targeted sampling sites. Sampling sites may not include faucets that have point-of-use or point-of-entry treatment devices designed to remove inorganic contaminants. Once the sampling sites are selected they must be submitted to the Department on the required form for approval.

2. A water system shall use the information on lead, copper, and galvanized steel that it is required to collect under 310 CMR 22.19(4) and (5) ~~and(6)(7) of this part [special monitoring for corrosivity characteristics)~~ when conducting a materials evaluation. When an evaluation of the information collected pursuant to 310 CMR 22.19(4) and (5)~~(6)(7)~~ is insufficient to locate the requisite number of lead and copper sampling sites that meet the targeting criteria in 310 CMR 22.06B(7)(a), the water system shall review the sources of information listed below in order to identify a sufficient number of sampling sites. In addition, the system shall seek to collect such information where possible in the course of its normal operations (e.g., checking service line materials when reading water meters or performing maintenance activities):

a. all plumbing codes, permits, and records in the files of the building department(s) which indicate the plumbing materials that are installed within publicly and privately owned structures connected to the distribution system;

b. all inspections and records of the distribution system that indicate the material composition of the service connections that connect a structure to the distribution system; and

c. all existing water quality information, which includes the results of all prior analyses of the system or individual structures connected to the system, indicating locations that may be particularly susceptible to high lead or copper concentrations.

(c) Number of Samples. Water systems shall collect at least one sample during each monitoring period specified in 310 CMR 22.06B(7)(d) from the number of sites listed in the second column ("Standard Monitoring") of the table in 310 CMR 22.06B(7)(c). A system conducting reduced monitoring under 310 CMR 22.06B(7)(d)4. shall collect at ~~lest~~ least one sample from the number of sites specified in the third column ("Reduced Monitoring") of the table in 310 CMR 22.06B(7)(c).

System Size (No. People Served)	Number of sites (Standard Monitoring)	Number of sites (Reduced Monitoring)
>100,000	100	50
10,001-100,000	60	30
3,301 to 10,000	40	20
501 to 3,300	20	10

101 to 500	10	5
≤100	5	5

(d) Timing of Monitoring

1. Initial Tap Sampling. The first six-month monitoring period for small, medium-size and large systems shall begin on the following dates:

System Size (No. People Served)	First Six-month Monitoring Period Begins On
>50,000	January 1, 1992
3,301 to 50,000	July 1, 1992
≤3,300	July 1, 1993

a. All large systems shall monitor during two consecutive six-month periods.

b. All small and medium-size systems shall monitor during each six-month monitoring period until:

(i) the system exceeds the lead or copper action level and is therefore required to implement the corrosion control treatment requirements under 310 CMR 22.06B(2), in which case the system shall continue monitoring in accordance with 310 CMR 22.06B(7)(d)2., or

(ii) the system meets the lead and copper action levels during two consecutive six-month monitoring periods, in which case the system may reduce monitoring in accordance with 310 CMR 22.06B(7)(d)4.

2. Monitoring after Installation of Corrosion Control and Source Water Treatment.

a. Any large system which installs optimal corrosion control treatment pursuant to 310 CMR 22.06B(2)(d)4. shall monitor during two consecutive six-month monitoring periods by the date specified in 310 CMR 22.06B(2)(d)5.

b. Any small or medium-size system which installs optimal corrosion control treatment pursuant to 310 CMR 22.06B(2)(e)5. shall monitor during two consecutive six-month monitoring periods by the date specified in 310 CMR 22.06B(2)(e)6.

c. Any system which installs source water treatment pursuant to 310 CMR 22.06B(4)(a)3. shall monitor during two consecutive six-month monitoring periods by the date specified in 310 CMR 22.06B(4)(a)4.

3. Monitoring after Department Specifies Water Quality Parameter Values for Optimal Corrosion Control. After the Department specifies the values for water quality control parameters under 310 CMR 22.06(3)(f), a large water system shall monitor during each subsequent six-month monitoring period, with the first monitoring period to begin on the date the Department specifies the optimal values under 310 CMR 22.06B(3)(f).

4. Reduced Monitoring.

a. A small or medium-size water system that meets the lead and copper action levels during each of two consecutive six-month monitoring periods may reduce the number of samples in accordance with 310 CMR 22.06B(7)(c), and reduce the frequency of lead and copper tap sampling to once per year.

b. Any large water system that meets the lead and copper action levels and maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Department under 310 CMR 22.06B(3)(f) during each of two consecutive six-month monitoring periods may reduce the frequency of monitoring for lead and copper to once per calendar year and

to reduce the number of lead and copper samples in accordance with 310 CMR 22.06B(7)if it receives permission from the Department. The Department shall review monitoring, treatment, and other relevant information submitted by the water system in accordance with 310 CMR 22.06(B)(11), and shall notify the system in writing when it determines the system is eligible to commence reduced monitoring pursuant to 310 CMR 22.06B(7)(d)4. The Department shall review, and where appropriate, revise its determination when the system submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

c. A small or medium-size water system that meets the lead and copper action levels during three consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every three years. Any ~~water large~~ large water system that meets the lead and copper action levels and maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Department under 310 CMR 22.06B(3)(f) during three consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every three years if it receives written approval from the Department. The Department shall review monitoring, treatment, and other relevant information submitted by the water system in accordance with 310 CMR 22.06B(11) and shall notify the system in writing when it determined the system is eligible to reduce the frequency of monitoring to once every three years. The Department shall review, and where appropriate, revise its determination when the system submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

d. A water system that reduces the number and frequency of lead and copper tap sampling shall collect these samples from representative sites included in the pool of targeted sampling sites identified in 310 CMR 22.06B(7)(a). Systems sampling annually or less frequently shall conduct the lead and copper tap sampling during the months of June, July, August or September unless the Department has approved a different sampling period in accordance with 310 CMR 22.06B(7)(d)4.d.(i).

(i) The Department, at its discretion, may approve a different period for conducting the lead and copper tap sampling for systems collecting a reduced number of samples. Such a period shall be no longer than four consecutive months and shall represent a time of normal operation where the highest levels of lead are most likely to occur. For a non-transient non-community water system that does not operate during the months of June through September, and for which the period of normal operation where the highest levels of lead are most likely to occur is not known, the Department shall designate a period that represents a time of normal operation for the system.

(ii) Systems monitoring annually, that have been collecting samples during the months of June through September and that receive Department approval to alter their sample collection period under 310 CMR 22.06B(7)(d)4.d.(i), shall collect their next round of samples during a time period that ends no later than 21 months after the previous round of sampling. Systems monitoring triennially that have been collecting samples during the months of June through September, and receive Department approval to alter the sampling collection period as per 310 CMR 22.06B(7)(d)4.d.(i), shall collect their next round of samples during a time period that ends no later than 45 months after the previous round of

sampling. Subsequent rounds of sampling shall be collected annually or triennially, as required by 310 CMR 22.06B(7)(d)4.d.~~(ii).~~ Small systems with waivers, granted pursuant to 310 CMR 22.06B(7)(g), that have been collecting samples during the months of June through September and choose to alter their sample collection period under 310 CMR 22.06B(7)(d)4.d.(i) shall collect their next round of samples before the end of the nine-year period.

e. Any water system that demonstrates for two consecutive six-month monitoring periods that the tap water lead level computed under 310 CMR 22.06B(1)(c)3. is less than or equal to 0.005 mg/L and the tap water copper level computed under 310 CMR 22.06B(1)(c)3. is less than or equal to 0.65 mg/L may reduce the number of samples in accordance with 310 CMR 22.06B(7)(c) and reduce the frequency of sampling to once every three calendar years.

f. A small or medium-size water system subject to reduced monitoring that exceeds the lead or copper action level shall resume sampling in accordance with 310 CMR 22.06B(7)(c) and collect the number of samples specified for standard monitoring under 310 CMR 22.06B(7)(c). Such system shall also conduct water quality parameter monitoring in accordance with 310 CMR 22.06B(8)(b), (c) or (d) (as appropriate) during the monitoring period in which it exceeded the action level. Any such small or medium system may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in 310 CMR 22.06B(7)(c) after it has completed two subsequent consecutive six-month rounds of monitoring that meet the criteria of 310 CMR 22.06B(7)(d)4.a. and/or may resume triennial monitoring for lead and copper at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either 310 CMR 22.06B(7) 310 CMR 22.06B(7)(d)4.c. or e.

g. Any large water system subject to the reduced monitoring frequency that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the Department under 310 CMR 22.06B(8)(f) for more than nine days in any six-month period specified in 310 CMR 22.06B(8)(d) shall conduct tap water sampling for lead and copper at the frequency specified in 310 CMR 22.06B(7)(d)3., collect the number of samples specified for standard monitoring under 310 CMR 22.06B(7)(c), and shall resume monitoring for water quality parameters within the distribution system in accordance with 310 CMR 22.06B(8)(d). Such a system may resume reduced monitoring for lead and copper at the tap and for water quality parameters within the distribution system under the following conditions:

(i) The system may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in 310 CMR 22.06B(7)(c)after it has completed two subsequent six-month rounds of monitoring that meet the criteria of 310 CMR 22.06B(7)(d)4.b. and the system has received written approval from the Department that it is appropriate to resume reduced monitoring on an annual frequency.

(ii) The system may resume triennial monitoring for lead and copper at the tap at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either 310 CMR 22.06B(7)(d)4.c. or e. and the system has received written approval from the Department that it is appropriate to resume triennial monitoring.

(iii) The system may reduce the number of water quality parameter tap water samples required in accordance with 310 CMR 22.06B(8)(e)1. and the frequency with which it collects such samples in accordance with 310 CMR 22.06B (8)(e)2. Such a system may not resume triennial monitoring for water quality parameters

at the tap until it demonstrates, in accordance with the requirements of 310 CMR 22.06B(8)(e)2., that it has re-qualified for triennial monitoring.

h. ~~(iv)~~ Any water system subject to a reduced monitoring frequency under 310 CMR 22.06B(7)(d)4. that either adds a new source of water or changes any water treatment shall inform the Department in writing in accordance with 310 CMR 22.06B(11)(a)3. The Department may require the system to resume sampling in accordance with 310 CMR 22.06B(7)(d)3. and collect the number of samples specified for standard monitoring under 310 CMR 22.06B(7)(c) or take other appropriate steps such as increased water quality parameter monitoring or re-evaluation of its corrosion control treatment given the potentially different water quality considerations.

Delete Section 22.06D and replace as follows:

22.06D: RESERVED

Delete Section 22.07 and replace as follows:

22.07: RESERVED

Amend Section 22.07A as follows:

22.07A: Synthetic Organic Chemicals (SOC) Sampling and Analytical Requirements

(2) SOC Sampling Requirements: Beginning with the initial compliance period, analysis of the contaminants listed in 310 CMR 22.07A(1)(a) through (gg) for the purposes of determining compliance with the maximum contaminant level shall be conducted as follows:

(a) SOC Ground Water Monitoring Protocols: Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(b) SOC Surface Water Monitoring Protocols: Surface water systems [Note: For purposes of 310 CMR 22.07A(2)(b), surface water systems include systems with a combination of surface and ground sources.) shall take a minimum of one sample at points in the distribution system that are representative of each source or at each entry point to the distribution system after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(c) Multiple Sources: If the system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used).

(d) Consecutive System Monitoring: Public water systems that obtain water from another public water system are exempt from conducting compliance monitoring for the purchased portion of the system for the organic chemicals (SOC) under 310 CMR 22.07~~(A),~~ A provided that the system from which the water is obtained has conducted the analyses required under 310 CMR 22.07~~(A)~~A, unless otherwise specified by the Department.

10) SOC Analytical Methods

j) Method 515.3 can be used to measure 2,4-D dalapon, dinoseb, ~~penachorophenol~~ pentachlorophenol, 2,4,5-TP and picloram

(11) Analysis for PCBs shall be conducted as follows:

(a) Each system that monitors for PCBs shall analyze each sample using either Method 508.1, 525.2, 508 or 505. The mean of the method detection limits of all Aroclors shall be 0.00025mg/l except for Aroclor 1221 which is 0.02 mg/l. Users of Method 505 may have more difficulty in achieving the required Aloclor detection limits than using methods 508.1, 525.2 or 508.

1. A lab may conduct a~~A lab may conduct a~~ scan for Aroclors using any one of the four methods mentioned in 310 22.07A(11)(a).

2. A lab that is certified for any of the four methods listed in 310 22.07A(11)(a) is eligible to conduct the scan for Aroclors.

~~(~~(b) If PCBs (as one of seven Aroclors) are detected as designated in 310 CMR 22.07A(11)(a) the system shall reanalyze the sample using Method 508A to quantitate PCBs (as decachlorobiphenyl).

~~(~~(c) Compliance with the PCB MCL shall be determined based upon the quantitative results of analyses using Method 508A.

(17) SYNTHETIC ORGANIC BATs: The EPA Administrator, pursuant to Section 1412 of the federal Safe Drinking Water Act, has identified as indicated in the Table below either granular activated carbon (GAC), packed tower aeration (PTA), or oxidation (OX) as the best technology, treatment technique, or other means available for achieving compliance with the maximum contaminant level for organic contaminants identified in 310 CMR 22.07A(1):

BAT FOR ORGANIC CONTAMINANTS LISTED IN 310 CMR 22.07A(1)

CAS #	Chemical	GAC	PTA	OX
15972-60-8	Alachlor	X		
116-06-3	Aldicarb	X		
1646-88-4	Aldicarb sulfone		X	
1646-87-3	Aldicarb sulfoxide		X	
1912-24-9	Atrazine	X		
50-32-8	Benzo[a]pyrene	X		
1563-66-2	Carbofuran		X	
57-74-9	Chlordane	X		
75-99-0	Dalapon	X		
96-12-8	Dibromochloropropane (DBCP)	X	X	
75-09-2	Dichloreomethane		X	
103-23-1	Di (2-ethylhexyl) adipate	XX	X	
117-81-7	Di (2-ethylhexyl) phthalate	X		
88-85-7	Dinoseb	X		
85-00-7	Diquat	X		
94-75-7	2,4-D	X		
72-20-8~~0~~	Endrin	X		
145-73-3	Endothall	X		
106-93-4	Ethylene Dibromide (EDB)	X	X	
1071-~~5~~8 3-6	Glyphosate			X
76-44-8	Heptachlor	X		

1024-57-3`	Heptachlor epoxide	X	
118-74-1	Hexachlorobenzene	X	
77-47-3	Hexachlorocyclopentadiene	X	X
58-89-9	Lindane	X	
72-43-5	Methoxychlor	X	
1336-36-3	Polychlorinated biphenyls(PCB)		X
23135-22-0	Oxamyl (Vydate)	X	

BAT FOR ORGANIC CONTAMINANTS LISTED IN 310 CMR 22.07A(1)

CAS #	Chemical	GAC	PTA	OX
87-86-5	Pentachlorophenol	X		
1918-02-1	Picloram	X		
93-72-1	2,4,5-TP (Silvex)	X		
122-34-9	Simazine	X		
120-82-1	1,2,4-Trichlorobenzene	X	X	
79-00-5	1,1,2-Trichloroethane	X	X	
1746-01-6	2,3,7,8-TCDD(Dioxin)	X		
8001-35-2	Toxaphene	X	X	

Amend Section 22.07E as follows:

22.07E: Disinfection Byproducts, Disinfectant Residuals and Disinfection Byproduct Precursors

(7) Monitoring Requirements.

(a) General Requirements.

1. Each supplier of water shall take all samples during normal operating conditions.

2. For the purpose of determining the minimum number of required TTHM and HAA5 samples, the Department may allow multiple wells drawing water from the same aquifer but entering the distribution system at different locations to be considered one treatment plant. Upon written request from a supplier of water, the Department will make this determination based on the following criteria:

a. The wells must be shown to be in the same aquifer using Department GIS and USGS information.

b. The wells must be treated in the same fashion or with processes that can be shown to be equivalent with respect to the potential to form disinfection byproducts.

c. TOC samples from each well under consideration, taken ~~at the same time~~ during August, ~~the warmest month of the year,~~ must have comparable results.

3. Each supplier of water shall monitor in accordance with the monitoring plan required under 310 CMR 22.07E(7)(f).

4. Each supplier of water may use only data collected under the provisions of 310 CMR 22.07E ~~or EPA's Information Collection Rule~~ to qualify for reduced monitoring.

5. Each supplier of water who qualifies for reduced monitoring shall obtain Department approval prior to altering sampling practices.

(b) Monitoring Requirements for Disinfection Byproducts.

1. TTHM and HAA5.

a. Routine Monitoring. Each supplier of water shall monitor at the frequency indicated in the following table:

Routine Monitoring Frequency for TTHM and HAA5

Type of system	Minimum monitoring frequency	Sample location in the distribution system
Systems using surface water or ground water under the direct influence of surface water serving at least 10,000 persons.	Four water samples per quarter per treatment plant.	At least 25% of all samples collected each quarter at locations representing maximum residence time. Remaining samples taken at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods.[1]
Systems using surface water or ground water under the direct influence of surface water serving from 500 to 9,999 persons.	One water sample per quarter per treatment plant.	Locations representing maximum residence time.[1]
Systems using surface water or ground water under the direct influence of surface water serving fewer than 500 persons.	One sample per year per treatment plant during August. ~~month of warmest water temperature.~~	Locations representing maximum residence time.[1] If the sample (or average of annual samples, if more than one sample is taken) exceeds the MCL, the system shall increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until the system meets reduced monitoring criteria in 310 CMR 22.07E(7)(b)1.d.
Systems using only ground water not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons.	One water sample per quarter per treatment plant.[2]	Locations representing maximum residence time.[1]
Systems using only ground water not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons.	One sample per year per treatment plant during August~~month of warmest water temperature~~.[2]	Locations representing maximum residence time.[1] If the sample (or average of annual samples, if more than one sample is taken) exceeds the MCL, the system shall increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until the system meets reduced monitoring criteria in 310 CMR 22.07E(7)(b)1.d.

[1] If a system elects to sample more frequently than the minimum required, at least 25% of all samples collected each quarter (including those taken in excess of the required frequency) shall be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples shall be taken at locations representative of at least average residence time in the distribution system.
[2] Multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with prior Department approval in accordance with criteria developed under 310 CMR 22.07E(7)(a)2.

b. A supplier of water may reduce monitoring, except as otherwise provided, in accordance with the following table:

Reduced Monitoring Frequency for TTHM and HAA5

If you are a . . .	You may reduce monitoring if you have monitored at least one year and your . .	To this level
System using surface water or ground water under the direct influence of surface water serving at least 10,000 persons which has a source water annual average TOC level, before any treatment, ≤ 4.0 mg/l.	TTHM annual average ≤ 0.040 mg/l and HAA5 annual average ≤ 0.030 mg/l.	One sample per treatment plant per quarter at distribution system location reflecting maximum residence time.
System using surface water or ground water under the direct influence of surface water serving from 500 to 9,999 persons which has a source water annual average TOC level, before any treatment, ≤ 4.0 mg/l.	TTHM annual average ≤ 0.040 mg/l and HAA5 annual average ≤ 0.030 mg/l.	One sample per treatment plant per year at distribution system location reflecting maximum residence time during August~~month of warmest water temperature.~~ NOTE: Any system using surface water or ground water under the direct influence of surface water serving fewer than 500 persons may not reduce its monitoring to less than one sample per treatment plant per year.
System using only ground water not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons.	TTHM annual average≤ 0.040 mg/l and HAA5 annual average ≤ 0.030 mg/l.	One sample per treatment plant per year at distribution system location reflecting maximum residence time during August.~~month of warmest water temperature.~~
System using only ground water not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons.	TTHM annual average≤ 0.040 mg/l and HAA5 annual average ≤ 0.030 mg/l for two consecutive years OR TTHM annual average ≤ 0.020 mg/l and HAA5 annual average ≤ 0.015 mg/l for one year.	One sample per treatment plant per three year monitoring cycle at distribution system location reflecting maximum residence time during August~~the month of warmest water temperature~~, with the three-year cycle beginning on January 1 following the quarter in

		which system qualifies for reduced monitoring.

c. Each supplier of water on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for systems which shall monitor quarterly) or the result of the sample (for systems which shall monitor no more frequently than annually) is no more than 0.060 mg/l and 0.045 mg/l for TTHM and HAA5, respectively. Systems that do not meet these levels shall resume monitoring at the frequency identified in 310 CMR 22.07E(7)(b)1.a. (minimum monitoring frequency column) in the quarter immediately following the monitoring period in which the system exceeds 0.060 mg/l or 0.045 mg/l for TTHM or HAA5, respectively. For each supplier of water using ground water not under the direct influence of surface water and serving fewer than 10,000 persons, if either the TTHM annual average is > 0.080 mg/l or the HAA5 annual average is > 0.060 mg/l, the system shall go to increased monitoring identified in 310CMR 22.07E(7)(b)1a (sample location in the distribution system column) in the quarter immediately following the monitoring period in which the system exceeds 0.080 mg/l or 0/060 mg/l for TTHM or HAA5 respectively.

d. Each supplier of water on increased monitoring may return to routine monitoring if after at least one year of monitoring their TTHM annual average is≤ 0.060 mg/l and their HAA5 annual average is ≤ 0.045 mg/l.

e. The Department may return a supplier of water to routine monitoring at the Department's discretion.

(8) Compliance Requirements:

(a) General Requirements.

1. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system fails to monitor for TTHM, HAA5, or bromate, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the supplier's failure to monitor makes it impossible to determine compliance with MRDLs for chlorine and chloramines, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average.

2. All samples taken and analyzed under the provisions of 310 CMR 22.07E shall be included in determining compliance, even if that number is greater than the minimum required.

3. If, during the first year of monitoring under 310 CMR 22.07E(7), any individual quarter's average will cause the running annual average of that system to exceed the MCL for total trihalomethanes, haloacetic acids (five), or bromate; or the MRDL for chlorine or chloramine, the system is out of compliance at the end of that quarter.

Delete Section 22.09 and replace as follows:

22.09: RESERVED

Amend Section 22.09A as follows:

22.09A: Maximum Radionuclide Contaminant Levels, Monitoring Requirements and Analytical Methods Effective as of December 8, 2003

(1) Maximum Contaminant Levels for Radionuclides: The maximum contaminant levels for radionuclide contaminants of 310 CMR 22.09A apply only to community water systems. The MCLs for radionuclides are as indicated in 310 CMR 22.09A: *Table A*:

TABLE A
MAXIMUM CONTAMINANT LEVELS FOR RADIONUCLIDES

Contaminant	MCL
Combined radium-226 and radium-228	5 pCi/L
Gross alpha particle activity (excluding radon and uranium)	15 pCi/L
Beta particle and photon radioactivity	4 mrem/year
Uranium	30 μg/L

(a) MCL for combined radium-226 and radium-228. The maximum contaminant level for combined radium-226 and radium-228 is 5 pCi/L. The combined radium-226 and radium-228 value is determined by the addition of the results of the analysis for radium-226 and the analysis for radium-228.

(b) MCL for gross alpha particle activity (excluding radon and uranium). The maximum contaminant level for gross alpha particle activity (including radium-226 but excluding radon and uranium) is 15 pCi/L.

(c) MCL for beta particle and photon radioactivity.

1. The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water must not produce an annual dose equivalent to the total body or any internal organ greater than four millirem/year (mrem/year).

2. Except for the radionuclides listed in 310 CMR 22.09A: *Table B*, the concentration of man-made radionuclides causing four mrem total body or organ dose equivalents must be calculated on the basis of two liter per day drinking water intake using the 168 hour data list in ‘‘Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure,’’ NBS (National Bureau of Standards) Handbook 69 as amended August 1963, U.S. Department of Commerce. ~~This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51~~. Copies of this document are available from the National Technical Information Service, NTIS ADA 280 282, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll-free number is 800–553–6847. Copies may be inspected at EPA’s Drinking Water Docket, 401 M Street, SW., Washington, DC 20460; or at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, DC. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed four mrem/year.

TABLE B
AVERAGE ANNUAL CONCENTRATIONS ASSUMED TO PRODUCE: A TOTAL BODY OR ORGAN DOSE OF 4 MREM/YR

Radionuclide	Critical organ	pCi/L
Tritium	Total body	20,000
Strontium-90	Bone Marrow	8

(d) MCL for Uranium. The maximum contaminant level for uranium is 30 µg/L.

(e) Compliance Dates for Combined Radium-226 and 228, Gross Alpha Particle Activity, Gross Beta Particle and Photon Radioactivity, and Uranium.

1. Community water systems must comply with the MCLs listed in 310 CMR 22.09A(1): *Table A* beginning December 8, 2003 and compliance shall be determined in accordance with the requirements of 310 CMR 22.09A(1) ~~and~~ through(5). Compliance with reporting requirements for the radionuclides under 310 CMR 22.16 and 310 CMR 22.16A~~310 CMR 22.09A~~ is required beginning December 8, 2003.

(2) Monitoring Frequency and Compliance Requirements for Radionuclides in Community Water Supplies.

(e) A gross alpha particle activity measurement may be substituted for the required radium-226 measurement provided that the measured gross alpha particle activity does not exceed 5 pCi/l. A gross alpha particle activity measurement may be substituted for the required uranium measurement provided that the measured gross alpha particle activity does not exceed 15 pCi/l. The gross alpha measurement shall have a confidence interval of 95% (1.96σ~~65s6~~, where ~~s~~σ is the standard deviation of the net counting rate of the sample) for radium-226 and uranium. When a supplier of water uses a gross alpha particle activity measurement in lieu of a radium-226 and/or uranium measurement, the gross alpha particle activity analytical result will be used to determine the future monitoring frequency for radium-226 and/or uranium. If the gross alpha particle activity result is less than detection, ½ the detection limit will be used to determine compliance and the future monitoring frequency.

(3) Monitoring and Compliance Requirements for Beta Particle and Photon Radioactivity. To determine compliance with the maximum contaminant levels in 310 CMR 22.09A: *Table A* for beta particle and photon radioactivity, a system must monitor at a frequency as follows:

(a) Community water systems (both surface and ground water) designated by the Department as vulnerable must sample for beta particle and photon radioactivity. The supplier of water must collect quarterly samples for beta emitters and annual samples for tritium and strontium-90 at each entry point to the distribution system (hereafter called a sampling point), beginning within one quarter after being notified by the Department. Systems already designated by the Department must continue to sample until the Department reviews and either reaffirms or removes the designation.

1. If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 50 pCi/L (screening level), the Department may reduce the frequency of monitoring at that sampling point to once every three years. The supplier of water must collect all samples required in 310 CMR 22.09A(3)(a) during the reduced monitoring period.

2. For systems in the vicinity of a nuclear facility, the Department may allow the community water system to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's entry point(s), where the Department determines if such data is applicable to a particular water system. In the

event that there is a release from a nuclear facility, systems which are using surveillance data must begin monitoring at the community water system's entry point(s) in accordance with 310 CMR 22.09A(3)(a).

(b) Community water systems (both surface and ground water) designated by the Department as utilizing waters contaminated by effluents from nuclear facilities must sample for beta particle and photon radioactivity. The supplier of water must collect quarterly samples for beta emitters and iodine-131 and annual samples for tritium and strontium-90 at each entry point to the distribution system (hereafter called a sampling point), beginning within one quarter after being notified by the Department. Systems already designated by the Department as systems using waters contaminated by effluents from nuclear facilities must continue to sample until the Department reviews and either reaffirms or removes the designation.

1. Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples or the analysis of a composite of three monthly samples. The former is recommended.
2. For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. As ordered by the Department, more frequent monitoring shall be conducted when iodine-131 is identified in the finished water.
3. Annual monitoring for strontium-90 and tritium shall be conducted by means of the analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples. The latter procedure is recommended.
4. If the gross beta particle activity beta minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 15 pCi/L (screening level), the Department may reduce the frequency of monitoring at that sampling point to every three years. The supplier of water must collect all samples required in 310 CMR 2.09A(3)(b) during the reduced monitoring period.
5. For systems in the vicinity of a nuclear facility, the Department may allow the community water system to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's entry point(s), where the Department determines if such data is applicable to a particular water system. In the event that there is a release from a nuclear facility, systems which are using surveillance data must begin monitoring at the community water system's entry point(s) in accordance with 310 CMR 22.09A(3)(b).

(c) Community water systems designated by the Department to monitor for beta particle and photon radioactivity can not apply to the Department for a waiver from the monitoring frequencies specified in 310 CMR 22.09A(3)(a) or 310 CMR 22.09A (3)(b).

(d) Community water systems may analyze for naturally occurring potassium-40 beta particle activity from the same or equivalent sample used for the gross beta particle activity analysis. The supplier of water is allowed to subtract the potassium-40 beta particle activity value from the total gross beta particle activity value to determine if the screening level is exceeded. The potassium-40 beta particle activity must be calculated by multiplying elemental potassium concentrations (in mg/L) by a factor of 0.82.

(e) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity exceeds the appropriate screening level, an analysis of the sample must be performed to identify the major radioactive constituents present in the sample and the appropriate doses must be calculated and summed to determine compliance with 310 CMR 22.09A(1)(c)1., using the formula in 310 CMR 22.09A(1)(c)2. Doses must also be calculated and combined for measured levels of tritium and strontium to determine compliance.

(f) The supplier of water must monitor monthly at the sampling point(s) which exceed the maximum contaminant level in 310 CMR 22.09A: *Table A* beginning the month after the exceedance occurs. The supplier of water must continue monthly monitoring until the system has established, by a rolling average of 3 monthly samples, that the MCL is being met. Systems who establish that the MCL is being met must return to quarterly monitoring until they meet the requirements set forth in 310 CMR 22.09A(3)(a)2. or 310 CMR 22.09A (3)(b)1.

(5) Analytical Methods for Radioactivity.

(a) Analysis for the following contaminants shall be conducted to determine compliance with 310 CMR 22.09A(1) in accordance with the methods in 310 CMR 22.09A: *Table F* or their equivalent as determined by USEPA.

TABLE F

ANALYTICAL METHODS FOR RADIONUCLIDE MONITORING

Contaminant	Methodology	Reference (method or page number)								
		EPA[1]	EPA[2]	EPA[3]	EPA[4]	SM[5]	ASTM[6]	USGS[7]	DOE[8]	Other
Naturally Occurring:										
Gross alpha & beta [11]	Evaporation	900.0	p 1	00-01	p 1	302, 7110 B		R–1120–76		
Gross alpha [11]	Co-precipitation			00-02		7110 C				
Radium 226	Radon emination	903.1	p 16	Ra-04	p 19	7500-Ra C	D 3454–97	R–1141–76	Ra-04	N.Y. [9]
	Radiochemical	903.0	p 13	Ra-03		304, 7500-Ra B	D 2460–97	R–1140–76		
Radium 228	Radiochemical	9043.4	p 24	Ra-05	p 19	7500-Ra D		R–1142–76		N.Y. [9] N.J. [10]
Uranium [12]	Radiochemical	908.0				7500-U B				
	Fluorometric	908.1				7500-U C (17th Ed.)	D 2907–97	R–1180–76	U-04	
								R–1181–76		
	Alpha spectronomy			00-07	p 33	7500-U C (18th, 19th, or 20th edition)	D 3972–97	R–1182–76	U-02	
	Laser phosphorimetry						D 5174–97			
	ICP-MS	200.8[13]				3125	D 5673-03			
Man-made:										
Radioactive cesium	Radiochemical	901.0	p 4			7500-Cs B	D 2459–72	R–1111–76		
	Gamma ray spectrometry	901.1			p 92	7120	D 3649–91	R–1110–76	4.5.2.3	
Radioactive iodine	Radiochemical	902.0	p 6 p 9			7500–1 B 7500–1 C 7500–1 D	D 3649–91			
	Gamma ray spectrometry	901.1			p 92	7120	D 4785–93		4.5.2.3	
Radioactive Strontium	Radiochemical	905.0	p 29	Sr-04	p 65	303, 7500-		R–1160–76	Sr-01	

89, 90						Sr B			
									Sr-02
Tritium	Liquid scintillation	906.0	p 34	H-02	p 87	306,7500–3H B	D 4107–91	R–1171–76	
Gamma emitters	Gamma ray spectrometry	901.1			p 92	7120	D 3649–91	R–1110–76	Ga-01-R
		902.0				7500-Cs B	D 4785–88		
		901.1				7500-I B			

[1] ''Prescribed Procedures for Measurement of Radioactivity in Drinking Water,'' EPA 600/4–80–032 , August 1980. Available at U.S. Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 (Telephone 800–553–6847), PB 80–224744, except Method 200.8, "Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma-Mass Spectrometry," Revision 5.4, which is published in "Methods for the Determination of Metals in Environmental Samples-Supplement 1," EPA 600-R-94-111, May 1994. Available at NTIS, PB95-125472.

[2] ''Interim Radiochemical Methodology for Drinking Water,'' EPA 600/4–75–008 (revised), March 1976. Available at NTIS, ibid. PB 253258.

[3] ''Radiochemistry Procedures Manual'', EPA 520/5–84–006, December 1987. Available at NTIS, ibid. PB 84–215581.

[4] ''Radiochemical Analytical Procedures for Analysis of Environmental Samples,'' U.S. Department of Energy, March 1979. Available at NTIS, ibid. EMSL LV 053917.

[5] Standard Methods for the Examination of Water and Wastewater, 13th, 17th, 18th, 19th, or 20th editions, 1971, 1989, 1992, 1995 and 1998. Available at American Public Health Association, 1015 Fifteenth Street N.W., Washington, D.C. 20005. Methods 302, 303, 304, 305 and 306 are only in the 13th edition. Methods 7110B, 7500-Ra B, 7500-Ra C, 7500-Ra D, 7500-U B, 7500-Cs B, 7500-I B, 7500–I C, 7500–I D, 7500-Sr B, 7500–3H B are in the 17th, 18th, 19th, and 20th editions. Method 7110C is in the 18th, 19th, and 20th editions. Method 7500-U C Fluorometric Uranium is only in the 17th Edition, and 7500-U C Alpha spectrometry is only in the 18th, 19th, and 20th editions. Method 7120 is only in the 19th and 20th editions. Methods 302, 303, 304, 305 and 306 are only in the 13th edition. Method 3125 is only in the 20th edition.

[6] Annual Book of ASTM Standards, Vol. 11.01 and 11.02, ~~1994~~ 1999; American Society for Testing and Materials International; any year containing the cited version of the method may be used. Copies of these two volumes and the 2003 version of D 5673-03 may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

[7] ''Methods for Determination of Radioactive Substances in Water and Fluvial Sediments,'' Chapter A5 in Book 5 of Techniques of Water-Resources Investigations of the United States Geo-logical Survey, 1977. Available at U.S. Geological Survey Information Services, Box 25286, Federal Center, Denver, CO 80225–0425.

[8] ''EML Procedures Manual'', 27th (1990) ~~Edition~~, or 28th (1997) Editions, Volume 1 and 2, ~~1990~~; either edition may be used. In the 27th Edition Method Ra-04 is listed as Ra-05 and Method Ga-01-R is listed as Sect. 4.5.2.3. Available at the Environmental Measurements Laboratory, U.S. Department of Energy (DOE), 376 Hudson Street, New York, NY 10014–3621.

[9] ''Determination of Ra-226 and Ra-228 (Ra-02),'' January 1980; Revised June 1982. Available at Radiological Sciences Institute Center for Laboratories and Research, New York State Department of Health, Empire State Plaza, Albany, NY 12201.

[10] ''Determination of Radium 228 in Drinking Water,'' August 1980. Available at State of New Jersey, Department of Environmental Protection, Division of Environmental Quality, Bureau of Radiation and Inorganic Analytical Services, 9 Ewing Street, Trenton, NJ 08625.

[11] Natural uranium and thorium-230 are approved as gross alpha-particle activity calibration standards for the gross alpha co-precipitation and evaporation methods; americium-241 is approved for use with the gross alpha co-precipitation methods.

[12] If uranium (U) is determined by mass-type methods (i.e., fluorometric or laser phosphorimetry), a 0.67 pCi/mg uranium conversion factor must be used. This conversion factor is conservative and is based on the 1:1 activity ratio of U-234 to U-238 that is characteristic of naturally-occurring uranium in rock.

[13] "Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma-Mass Spectrometry, "Revision 5.4, which is published in "Methods for the Determination of Metals in Environmental Samples-Supplement 1," EPA 600-R-94-111, May 1994. Available at NTIS, PB 95-125472.

(b) To determine compliance with 310 CMR 22.09A(1) the detection limit shall not exceed the concentrations as indicated in 310 CMR 22.09A *Table G*.

TABLE G
REQUIRED REGULATORY DETECTION LIMITS FOR VARIOUS RADIOCHEMICAL CONTAMINANTS

Contaminant	**Detection Limit (pCi/L)**
Gross alpha	3
Gross beta	4
Radium-226	1
Radium-228	1
Uranium	~~Reserved~~ 1 [ug/L]
Cesium-134	10
Strontium-89	10
Strontium-90	2
Iodine-131	1
Tritium	1000
Other radionuclides and Photon/Gamma Emmitters	$1/10^{th}$ of the rule

Amend Section 22.13 as follows:

22.13: Variances

The Department upon receipt of an application from the public water system, may grant variances from the requirements of 310 CMR 22.05 to 310 CMR 22.09A, inclusive, but only subject to the following conditions:

(1) The Department may grant one or more variances to one or more public water systems
(a) which, because of characteristics of the raw water sources
which are reasonably available to the system(s), cannot comply with a prescribed maximum contaminant level or levels despite application of the best technology, treatment techniques, or other means, which the Department finds are generally available, taking costs into consideration. The Department shall not grant a variance pursuant to 310 CMR 22.13(1)(a) unless the Department finds in consultation with the Massachusetts Department of Public Health that the variance will not result in an unreasonable risk to health. If the Department grants a public water system a variance pursuant to 310 CMR 22.13(1)(a) the Department shall prescribe at the time ~~within one year of the date~~ the variance is granted, a compliance schedule for:

1. a. Compliance, within the shortest practicable time feasible under the circumstances but not to exceed 5–years, except as provided below in 310 CMR 22.13(1)(a)2, including increments of progress by the public water system with each maximum contaminant level requirement with respect to which the variance was granted; and

b.~~2.~~ —Implementation by the public water system of such control measures as the Department may require for each contaminant, that is subject to the maximum contaminant level requirement, during the period ending on the date compliance with such requirement is required.

2. If the compliance schedule exceeds 5 years from the date of issuance, then the public water systems must:

a. Document its rationale for the extended compliance schedule;

b. Discuss the rationale for the extended compliance schedule in the required public notice and opportunity for public comment; and

c. Provide the shortest practicable time schedule feasible under the circumstances.

4) Every variance issued by the Department shall be conditioned on compliance by the public water system with the requirements set forth in 310 CMR 22.13(3)(a) – (h). Said requirements shall have the same force and effect they would have if specifically set forth in 310 CMR 22.00.

(7) Best Available Technologies (BATs) ~~for Organic Compounds~~:

(a) BATs for Organic Compounds: The following technologies listed in 310 CMR 22.13(7)(a)1. through (a)54. are identified by the EPA Administrator, pursuant to section 1415(a) (1)(A) of the federal Safe Drinking Water Act as the best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for organic chemicals as listed in 310 CMR 22.07A(1) and 22.07B(1).

(c) Best Available Technologies (BATs) for Radionuclides: The Department shall require community water systems to install and/or use any treatment technology identified in 310 CMR 22.09A Table C, or in the case of small water systems (those serving 10,000 persons or fewer), 310 CMR 22.09A Table D and Table E , as a condition for granting a variance under 310 CMR 22.13 or 310CMR 22.13A, Small System Variances, except as provided in 310 CMR 2213(7)(e).

(d)~~c~~) Requirement to Install BAT: The Department shall require community water systems and non-transient, non-community water systems to install and/or use any treatment method identified in 310 CMR 22.13(7)(a) and (b) as a condition for granting a variance except as provided in 310 CMR 22.13(7)(~~cd~~). If, after the system's installation of the treatment method, the system cannot meet the MCL, that system shall be eligible for a variance under the provisions of 310 CMR 22.13 - or 310 CMR 22.13A, if~~s~~ the system serves fewer than 10,000 persons..

(~~d~~e) Engineering Assessment Option: If a system can demonstrate through comprehensive engineering assessments, which may include pilot plant studies, that the treatment methods identified in 310 CMR 22.13(7)(a),~~ and~~ (b), and (c) would only achieve a *de minimis* reduction in contaminants, the Department may issue a schedule of compliance that requires the system being granted the variance to examine other treatment methods as a condition of obtaining the variance.

(~~e~~f) Compliance Schedule: If the Department determines that a treatment method identified in 310 CMR 22.13(7)(~~d~~e) is technically feasible, the Department may require the system to

install and/or use that treatment method in connection with a compliance schedule issued under the provisions of section 1415(a)(1)(A) of the Safe Drinking Water Act.
The Department's determination shall be based upon studies by the system and other relevant information.

(8) No variances from the requirements set forth in 310 CMR 22.20A are allowed.

(9) No variances from the maximum contaminant level for total coliforms in 310 CMR 22.05(8) are allowed except as specified at 310 CMR 22.05(10) and in accordance with the variance requirements and procedures set forth in 310 CMR 22.13.

Amend Section 22.14 as follows:

22.14 Exemptions

The Department may upon receipt of an application, exempt any public water system from any maximum contaminant level prescribed in 310 CMR 22.06 through 310 CMR 22.09A, or from any prescribed treatment technique, or from both, but only subject to the following conditions:

(1) (d) Management or restructuring changes (or both)~~), as provided in 40 CFR, Safe Drinking Water Act~~, ~~section 142.20(b)(1)(i)~~, cannot reasonably be made that

(i) ~~-W~~will result in compliance with these drinking water regulations, taking into consideration the circumstances specified in 40 C.F.R. §142.20(b)(1)(i) (as published in 63 Fed.Reg.43,847), which is hereby incorporated herein by reference; or

(ii) ~~the applicable Safe Drinking Water Act or,~~ if compliance cannot be achieved, will improve the quality of the drinking water.

(12) Before a schedule proposed by the Department pursuant to 310 CMR 22.14(11) may take effect the Department shall provide notice and opportunity for a public hearing on the schedule

(b) Requests for a hearing may be submitted by any interested person. Frivolous or insubstantial requests for hearing may be denied by the Department. Request must be submitted to the Department within 30 days after issuance of the public notices provided for in 310 CMR 22.14 ~~(5)(a)~~(12)(a). Such request shall include the following:

(c) The Department shall give notice in the manner set forth in 310 CMR 22.14~~(5)(a)~~ (12)~~-(b)~~ of any hearing to be held pursuant to a request submitted by an interested person or on his own motion. Notice of the hearing shall also be sent to the person requesting the hearing, in any, Notice of the hearing shall include a statement of the purpose of the hearing, information regarding the time and location of the hearing, and the address and telephone number of an office at which interested persons may obtain further information concerning the hearing. All hearing locations specified in the public notice shall be within the State. Notice of the hearing shall be given not less than 15 days prior to the time scheduled for the hearing.

d) ~~d) -~~A public.hearing convened pursuant to 310 CMR 22.14~~(5)(d) -~~(12)~~-(d)~~ shall be conducted before a hearing officer to be designated by the Department. The hearing shall be conducted by the hearing officer in an informal, orderly and expeditious manner. The hearing officer shall have authority to call witnesses, receive oral and written testimony and take such action as may be necessary to assure the fair and efficient conduct of the hearing. Following the conclusion of the hearing, the hearing officer shall forward the record of the hearing to the Department.

(16) Extension of Date for Compliance. In the case of a public water system which serves a population of not more than 3,300 persons and which needs financial assistance for the necessary improvements, an exemption granted under 310 CMR 22.14~~(1) or (2)~~ (2)(a) or (b)may be renewed for one or more additional two-year periods, but not to exceed a total of six additional years, if the public water system established that the public water system is taking all practicable steps to meet the requirements of 310 CMR 22.14(2) and the established compliance

schedule

(18) The Department shall promptly report to the Administrator or to the Administrator's designee every exemption or extension of an exemption granted by the Department. Such notification shall contain all of the following:

(a) The reason for the exemption or extension of the exemption;

(b) The basis for the Department's finding that the granting of the exemption or extension of the exemption will not result in an unreasonable risk to health; and

(c) Documentation of the need for the exemption or extension of the exemption.

(20) Exemptions from the requirements set forth at 310 CMR 22.06 through ~~and~~ 22.0~~7~~9A will be granted only in accordance with Section 1416 of the federal Safe Drinking Water Act and 40 CFR 142.62.

(27) Public water systems that use point-of-use or point-of-entry devices as a condition for obtaining a variance or and exemption from~~orm~~ 310 CMR 22.00 must meet the following requirements:

Amend Section 22.15 as follows:

22.15: General Reporting Requirements

(8) Notification of Imposition of Mandatory Water Use Restrictions and Local Drinking Water Health Advisory.

(a) All public water systems establishing a mandatory restriction on water use must notify the Department in writing within 14 days of its effective date. In its notice to the Department, the public water system establishing a mandatory restriction on water use shall include appropriate regulations, bylaws or ordinances establishing and imposing the restriction.

(b) Public water systems establishing water use restrictions should consider requesting from the Department a declaration of a state of water supply emergency pursuant to M.G.L. c. 21G.

(c) Public water systems who would issue ~~establishing~~ a local drinking water health advisory shall consult with and notify the Department prior to ~~within 48 hours of~~ issuance~~its imposition~~, and~~as well as~~ provide notification to the Department within 24 ~~48~~ hours of ~~its~~ termination.

Amend Section 22.16 as follows:

22.16: Public Notification Requirements

(5) Public Notice Content.

(b) Public Notice Requirements for Systems Operating under a Variance or Exemption.

1. If a supplier ~~o~~ of water has been granted a variance or an exemption, the public notice shall contain:

a. An explanation of the reasons for the variance or exemption;

b. The date on which the variance or exemption was issued;

c. A brief status report on the steps the system is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption; and

d. A notice of any opportunity for public input in the review of the variance or exemption

(7) Special Notice of the Availability of Unregulated Contaminant Monitoring Results.

(a) The owner or operator of a community water system or non-transient non-community water system required to monitor under 310 CMR 22.07C or the EPA Unregulated Contaminant Monitoring Rule shall notify persons served by the system of the availability of the results of such sampling no later than 12 months after the monitoring results are known.

(11) Public Notification by the Department for any Public Water System Subject to 310 CMR 22.00.

(a) The Department may require a supplier of water or any person subject to 310 CMR 22.00 to provide public notice for any violation of 310 CMR 22.00, the content of which shall either satisfy the requirements of 310 CMR 22.16(5), and/or be approved by the Department, prior to publication. The supplier of water remains legally responsible for ensuring that the requirements of 310 CMR 22.16 are met.

(b) The Department reserves the right to give notice to the public when not required by 310 CMR 22.16 in the event of a significant health problem. The supplier of water shall be responsible for all fees incurred by the Department as a result such notice.

310 CMR 22.16 - Table 6
Violations and Other Situations Requiring Public Notice [1]

Contaminant	MCL/MRDL/TT violations [2]		Monitoring & testing procedure violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
I. **Violations of National Primary Drinking Water Regulations[3] and 310 CMR 22.00**				
A. **Microbiological Contaminants**				
1. Total coliform	2	310 CMR 22.05	3	310 CMR 22.05
2. Fecal coliform/E. coli	1	310 CMR 22.05	[4] 1, 3	310 CMR 22.05
3. Turbidity MCL	2	310 CMR 22.08 310 CMR 22.20A 310 CMR 22.20D	3	310 CMR 22.08 310 CMR 22.20A 310 CMR 22.20D
4. Turbidity MCL (average of 2 days' samples 5 NTU)	[5] 2, 1	310 CMR 22.08 310 CMR 22.20A	3	310 CMR 22.08 310 CMR 22.20A

5. Turbidity (for TT violations resulting from a single exceedance of maximum allowable turbidity level)	[6] 2, 1	310 CMR 22.08 310 CMR 22.20A 310 CMR 22.20D 310 CMR 22.20F	3	310 CMR 22.08 310 CMR 22.20A 310CMR 22.20D 310 CMR 22.20F
6. Surface Water Treatment Rule violations, other than violations resulting from single exceedance of max. allowable turbidity level (TT).	2	310 CMR 22.20A	3	310 CMR 22.20A
7. Interim Enhanced Surface Water Treatment Rule violations, other than violations resulting from single exceedance of max. turbidity level (TT).	2	[7]310 CMR 22.20D	3	310 CMR 22.20D
8. Filter Backwash Recycling Rule	2	310 CMR 22.20E(3)	3	310 CMR 22.20E(2) and (4)
9. Long Term 1 Enhanced Surface Water Treatment Rule	2	310 CMR 22.20F	3	310 CMR 22.20F
B. **Inorganic Chemicals (IOCs)**				
1. Antimony	2	310 CMR 22.06	3	310 CMR 22.06
2. Arsenic	2	310 CMR 22.06	3	310 CMR 22.06
3. Asbestos (fibers > 10 mm)	2	310 CMR 22.06	3	310 CMR 22.06
4.Barium	2	310 CMR 22.06	3	310 CMR 22.06
5. Beryllium	2	310 CMR 22.06	3	310 CMR 22.06
6. Cadmium	2	310 CMR 22.06	3	310 CMR 22.06
7. Chromium (total)	2	310 CMR 22.06	3	310 CMR 22.06
8. Cyanide	2	310 CMR 22.06	3	310 CMR 22.06
9. Fluoride	2	310 CMR 22.06	3	310 CMR 22.06
10. Mercury (inorganic)	2	310 CMR 22.06	3	310 CMR 22.06
11. Nitrate	1	310 CMR 22.06	[10] 1, 3	310 CMR 22.06
12. Nitrite	1	310 CMR 22.06	[10] 1, 3	310 CMR 22.06
13. Total Nitrate and Nitrite	1	310 CMR 22.06	3	310 CMR 22.06
14. Selenium	2	310 CMR 22.06	3	310 CMR 22.06
15. Thallium	2	310 CMR 22.06	3	310 CMR 22.06
F. **Radioactive Contaminants**				
1. Beta/photon emitters	~~2~~	~~310 CMR 22.09~~	~~3~~	~~310 CMR 22.09~~
	2	310 CMR 22.09A	3	310 CMR 22.09A
2. Alpha emitters	~~2~~	~~310 CMR 22.09~~	~~3~~	~~310 CMR 22.09~~
	2	310 CMR 22.09A	3	310 CMR 22.09A
3. Combined radium (226 & 228)	~~2~~	~~310 CMR 22.09~~	~~3~~	~~310 CMR 22.09~~
	2	310 CMR 22.09A	3	310 CMR 22.09A
4. Uranium [11,12]	~~2~~	~~310 CMR 22.09~~	~~3~~	~~310 CMR 22.09~~
	2	310 CMR 22.09A	3	310 CMR 22.09A
G. **Disinfection Byproducts (DBPs),Byproduct Precursors, Disinfectant Residuals. Where disinfection used**				

in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). EPA sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acid (HAAs).[13]				
1. Total trihalomethanes (TTHMs)	2	~~310 CMR 22.07~~[14] 310 CMR 22.07E	3	~~310 CMR 22.07~~ 310 CMR 22.07E
2. Haloacetic Acids (HAA5)	2	310 CMR 22.07E	3	310 CMR 22.07E
3. Bromate	2	310 CMR 22.07E	3	310 CMR 22.07E
4. Chlorite	2	310 CMR 22.07E	3	310 CMR 22.07E
5. Chlorine (MRDL)	2	310 CMR 22.07E	3	310 CMR 22.07E
6. Chloramine (MRDL)	2	310 CMR 22.07E	3	310 CMR 22.07E
7. Chlorine dioxide (MRDL) where any two consecutive daily samples at entrance to distribution system only are above MRDL	2	310 CMR 22.07E	2 [15], 3	310 CMR 22.07E
8. Chlorine dioxide (MRDL), where sample(s) in distribution system the next day are also above MRDL	[16] 1	310 CMR 22.07E	1	310 CMR 22.07E
9. Control of DBP precursors TOC (TT)	2	310 CMR 22.07E	3	310 CMR 22.07E
10. Bench marking and disinfection profiling	N/A	N/A	3	310 CMR 22.07F
11. Development of monitoring plan	N/A	N/A	3	310 CMR 22.07E

Table 6 - Endnotes

1. Violations and other situations not listed in this table (e.g.~~*e.g.*~~ ,~~reporting violations and~~ failure to prepare Consumer Confidence Reports), do not require notice, unless otherwise determined by the Department. The Department may, at its option, also require a more stringent public notice tier (*e.g.*, Tier 1 instead of Tier 2 or Tier 2 instead of Tier 3) for specific violations and situations listed in this Table, as authorized under 310 CMR 22.16(2)(a) and 310 CMR 22.16(3)(a).
2. MCL-Maximum contaminant level, MRDL-Maximum residual disinfectant level, TT-Treatment technique.
3. The term Violations of 310 CMR 22.00 is used here to include violations of MCL, MRDL ,treatment technique, monitoring, and testing procedure requirements.
4. Failure to test for fecal coliform or E. coli is a Tier 1violation if testing is not done after any repeat sample tests positive for coliform. All other total coliform monitoring and testing procedure violations are Tier 3.
5. Systems that violate the turbidity MCL of 5 NTU based on an average of measurements over two consecutive days shall consult with the Department within 24 hours after learning of the violation. Based on this consultation, the Department may subsequently decide to elevate the violation to Tier 1. If a system is unable to make contact with the Department in the 24-hour period, the violation is automatically elevated to Tier 1.
6. Systems with treatment technique violations involving a single exceedance of a maximum turbidity limit under 310 CMR 22.20A, the Surface Water Treatment Rule (SWTR), 310 CMR 22.20D, the Interim Enhanced Surface Water Treatment Rule (IESWTR), or 310 CMR 22.20F, the Long Term 1 Enhanced Surface Water Treatment Rule, are required to consult with the Department within 24 hours after learning of the violation. Based on this consultation, the Department may subsequently decide to elevate the violation to Tier 1. If a system is unable to make contact with the Department in the 24-hour period, the violation is automatically elevated to Tier 1.
7. Most of the requirements of the Interim Enhanced Surface Water Treatment Rule 310 CMR 22.20D become

effective January 1, 2002 for surface water sources systems (surface water systems and ground water systems under the direct influence of surface water) serving at least 10,000 persons. However, 310 CMR 22.20D has some requirements that become effective as early as April 16, 1999. The Surface Water Treatment Rule, 310 CMR 22.20A, remains in effect for some systems serving at least 10,000 persons even after 2002; the Interim Enhanced Surface Water Treatment Rule, 310 CMR 22.20D, adds additional requirements and does not in many cases supercede the SWTR.

8. The arsenic MCL citations are effective January 23, 2006. Until then, the citations are 310 CMR 22.06.

9. The arsenic Tier 3 violation MCL citations are effective January 23, 2006. Until then, the citations are 310 CMR 22.06.

10. Failure to take a confirmation sample within 24 hours for nitrate or nitrite after an initial sample exceeds the MCL is a Tier 1 violation. Other monitoring violations for nitrate are Tier 3.

11. The uranium MCL Tier 2 violation citations are effective December 8, 2003 for all community water systems.

12. The uranium MCL Tier 3 violation citations are effective December 8, 200~~0~~3 for all community water systems.

13. Surface water sources systems (surface water systems and ground water systems under the direct influence of surface water) serving at least 10,000 persons (community and non-transient non-community systems) shall comply with the new DBP MCLs, disinfectant MRDLs, and related monitoring requirements beginning January 1, 2002. All other community and non-transient non-community systems shall meet the MCLs and MRDLs beginning January 1, 2004. Surface water sources systems (surface water systems and ground water systems under the direct influence of surface water) serving at least 10,000 persons transient non-community systems serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant shall comply with the chlorine dioxide MRDL beginning January 1, 2002. Surface water sources systems (surface water systems and ground water systems under the direct influence of surface water) serving at least 10,000 persons transient non-community systems serving fewer than 10,000 persons and using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant shall comply with the chlorine dioxide MRDL beginning January 1, 2004.

~~14. 310 CMR 22.07 will no longer apply after January 1, 2004.~~

15. Failure to monitor for chlorine dioxide at the entrance to the distribution system the day after exceeding the MRDL at the entrance to the distribution system is a Tier 2 violation.

16. If any daily sample taken at the entrance to the distribution system exceeds the MRDL for chlorine dioxide and one or more samples taken in the distribution system the next day exceed the MRDL, Tier 1 notification is required. Failure to take the required samples in the distribution system after the MRDL is exceeded at the entry point also triggers Tier 1 notification.

17. Some water systems shall monitor for certain unregulated contaminants listed in 310 CMR 22.07C.

18. This citation refers to 310 CMR 22.13 and 310 CMR 22.14 and requires that "a schedule prescribed~~,~~ for a public water system granted a variance [or exemption] shall require compliance by the system. ~~,~~"

19. In addition, 310 CMR 22.13A specifies the items and schedule milestones that shall be included in a variance for small systems.

20. Other waterborne emergencies require a Tier 1 public notice under 310 CMR 22.16 (2)(a)7. for situations that do not meet the definition of a waterborne disease outbreak given in 310CMR 22.02(1) but that still have the potential to have serious adverse effects on health as a result of short-term exposure. These could include outbreaks not related to treatment deficiencies, as well as situations that have the potential to cause outbreaks, such as failures or significant interruption in water treatment processes, natural disasters that disrupt the water supply or distribution system, chemical spills, or unexpected loading of possible pathogens into the source water.

21. The Department may place other situations in any tier they believe appropriate, based on threat to public health.

310 CMR 22.16 - Table 7

Standard Health Effects Language for Public Notification

Contaminant	MCLG[1] mg/l	MCL[2] mg/l	Standard health effects language for public notification
National Primary Drinking Water Regulations (NPDWR) and Massachusetts Drinking Water Regulations:			
A. Microbiological Contaminants:			
1a. Total coliform	Zero	See footnote[3]	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.
1b. Fecal coliform/E. coli	Zero	Zero	Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
2a. Turbidity (MCL)[4]	None	1 NTU[5] 5 NTU	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.
2b. Turbidity (SWTR TT)[6]	None	TT[7]	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.
2c. Turbidity (IESWTR TT) and LT1ESWTR TT)[8]	None	TT	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.
Surface Water Treatment Rule (SWTR), Interim Enhanced Surface Water Treatment Rule (IESWTR Filter			

Backwash Recycling Rule (FBRR)) and Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) violations:			
3. Giardia lamblia (SWTR/IESWTR/LT1ESWTR).			
4. Viruses (SWTR/IESWTR/ LT1ESWTR).			
5. Heterotrophic plate count (HPC) bacteria[9] (SWTR/IESWTR/LT1ESWTR).			Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
6. Legionella (SWTR/IESWTR/LT1ESWTR).			
7. Cryptosporidium (IESWTR/LT1ESWTR/FBRR).	Zero	TT[10]	
B. Inorganics			
8. Antimony	0.006	0.006	Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.
9. Arsenic[11]	None	0.05	Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.
10. Asbestos (10µm)	7MFL[12]	7MFL	Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.
11. Barium	2	2	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
12. Beryllium	0.004	0.004	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions
13. Cadmium	0.005	0.005	Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
14. Chromium (total).	0.1	0.1	Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
15. Cyanide	0.2	0.2	Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.
16. Fluoride	4.0	4.0	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the

			MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in develop-ing teeth before they erupt from the gums.
17. Mercury (inorganic)	0.002	0.002	Some people who drink water containing inor-ganic mercury well in excess of the MCL over many years could experience kidney damage
18. Nitrate	10	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
19. Nitrite	1	1	Infants ~~younger than of~~below the age of six months old who drink water containing nitrite in excess of the MCL could become seriously ill and, if un-treated, may die. Symptoms include shortness of breath and blue baby syndrome.
20. Total Nitrate and Nitrite	10	10	Infants ~~younger than of~~ below the age of six months old who drink water containing nitrate and nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
21. Selenium	0.05	0.05	Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could exper-ience hair or fingernail losses, numbness in fin-gers or toes, or problems with their circulation.
22. Thallium	0.0005	0.002	Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.

G. Disinfection Byproducts (DBPs),Byproduct Precursors, Disinfectant Residuals. Where disinfection used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). EPA sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acid (HAAs).[~~18~~ 17]			
80. Total trihalomethanes (TTHMs)	N/A	~~0.10~~ 0.080[~~18~~ 19]	Some people who drink water containing (TTHMs) trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.
81. Haloacetic Acids (HAA)	N/A	0.060[20]	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
82. Bromate	Zero	0.010	Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
83. Chlorite	0.08	1.0	Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.

84. Chlorine	4 (MRDLG)[21]	4.0 (MRDL)[22]	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.
85. Chloramines	4 (MRDLG)	4.0 (MRDL)	Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.
86a. Chlorine dioxide, where any 2 consecutive daily samples taken at the entrance to the distribution system are above the MRDL.			Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. *Add for public notification only:* The chlorine dioxide violations reported today are the result of exceedances at the treatment facility only, not within the distribution system which delivers water to consumers. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to consumers.
86b. Chlorine dioxide, where one or more distribution system samples are above the MRDL.	0.8 (MRCLG)	0.8 (MRDL)	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. *Add for public notification only:* The chlorine dioxide violations reported today include exceedances of the EPA standard within the distribution system which delivers water to consumers. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including fetuses, infants, and young children, may be especially susceptible to nervous system effects from excessive chlorine dioxide exposure.
87. Control of DBP precursors (TOC)	None	TT	Total organic carbon (TOC) has no health effects. However, total organic carbon provides a

		medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.

Table 7-Endnotes

1. MCLG-Maximum contaminant level goal
2. MCL-Maximum contaminant level
3. For water systems analyzing at least 40 samples per month, no more than 5.0% of the monthly samples may be positive for total coliforms. For systems analyzing fewer than 40 samples per month, no more than one sample per month may be positive for total coliforms.
4. There are various regulations that set turbidity standards for different types of systems, including 310 CMR 22.08, 310 CMR 22.20A, 310 CMR 22.20D, and 310 CMR 22.20F. The MCL for the monthly turbidity average is 1 NTU; the MCL for the 2-day average is 1 NTU for systems that are required to filter but have not yet installed filtration (310 CMR 22.08).
5. NTU-Nephelometric turbidity unit
6. There are various regulations that set turbidity standards for different types of systems, including 310 CMR 22.08, 310 CMR 22.20A, 310 CMR 22.20D, and 310 CMR 22.20F. Systems subject to the Surface Water Treatment Rule (both filtered and unfiltered) may not exceed 1 NTU. In addition, in filtered systems, 95% of samples each month shall not exceed 0.5 NTU in systems using conventional or direct filtration and shall not exceed 1 NTU in systems using slow sand or diatomaceous earth filtration or other filtration technologies approved by the Department.
7. TT-Treatment technique
8. There are various regulations that set turbidity standards for different types of systems, including 310 CMR 22.08, 310 CMR 22.20A, 310 CMR 22.20D, and 310 CMR 22.20F. For systems subject to 310 CMR 22.20D (systems serving at least 10,000 people, using surface water or ground water under the direct influence of surface water), that use conventional filtration or direct filtration, after January 1, 2002, the turbidity level of a system's combined filter effluent may not exceed 0.3 NTU in at least 95% of monthly measurements, and the turbidity level of a system's combined filter effluent shall not exceed 1 NTU at any time. Systems subject to 310 CMR 22.20D using technologies other than conventional, direct, slow sand, or diatomaceous earth filtration shall meet turbidity limits set by the Department. For systems subject 310 CMR 22.20F (systems serving fewer than 10,000 people, using surface water or ground water under the influence of surface water) that use conventional or direct filtration, after January 1, 2005 the turbidity level of a system's combined filter effluent may not exceed 0.3 NTU in at least 95% of monthly measurements, ant the turbidity level of a system's combined filter effluent must not exceed 1 NTU at any time. Systems subject to 310 CMR 22.20F using technologies other than conventional, direct, slow sand, or diatomaceous earth filtration must meet turbidity limits set by the Department.
9. The bacteria detected by heterotrophic plate count (HPC) are not necessarily harmful. HPC is simply an alternative method of determining disinfectant residual levels. The number of such bacteria is an indicator of whether there is enough disinfectant in the distribution system.
10. 310 CMR 22.20A, 310 CMR 22.20D, and 310 CMR 22.20F treatment technique violations that involve turbidity exceedances may use the health effects language for turbidity instead.
11. These arsenic values effective January 23, 2006. Until then, the MCL is 0.05 mg/L and there is no MCLG.
12. Millions fibers per liter.
13. Action Level = 0.015 mg/L

14. Action Level = 1.3 mg/L
15. Millirems per years
16. The uranium MCL is effective December 8, 2003 for all community water systems
17. Picocuries per liter
18. Surface water systems and ground water systems under the direct influence of surface water are regulated under 310 CMR 22.20A. Surface water sources systems (surface water systems and ground water systems under the direct influence of surface water) serving at least 10,000 persons community and non-transient non-community systems shall comply with DBP MCLs and disinfectant maximum residual disinfectant levels (MRDLs) beginning January 1, 2002. All other community and non-transient ~~non community~~ non-community systems shall meet the MCLs and MRDLs beginning January 1, 2004. Surface water sources systems (surface water systems and ground water systems under the direct influence of surface water) serving at least 10,000 or more persons transient non-community systems using chlorine dioxide as a disinfectant or oxidant shall comply with the chlorine dioxide MRDL beginning January 1, 2002. Surface water sources systems (surface water systems and ground water systems under the direct influence of surface water) serving fewer than 10,000 persons transient non-community systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant shall comply with the chlorine dioxide MRDL beginning January 1, 2004.

~~18. The MCL of 0.10 mg/l for TTHMs is in effect until January 1, 2002 for community surface water systems (surface water systems and ground water systems under the direct influence of surface water) serving 10,000 or more. This MCL is in effect until December 31, 2003 for community water systems with a population of less than 10,000 using only ground water not under the direct influence of surface water. After these deadlines, the MCL will be 0.080 mg/l. On January 1, 2004, all systems serving less than 10,000 will have to comply with the new MCL as well.~~

19. The MCL for total trihalomethanes is the sum of the concentrations of the individual trihalomethanes.
20. The MCL for haloacetic acids is the sum of the concentrations of the individual haloacetic acids.
21. MRDLG-Maximum residual disinfectant level goal.
22. MRDL-Maximum residual disinfectant level.

Amend Section 22.16A as follows:

22.16A: Consumer Confidence Reporting Requirements

(4) Content of the Reports. Each community water system must provide to its customers an annual report that contains the information specified in 310 CMR 22.16A(4).

(a) Each report must identify the source(s) of the water delivered by the community water system by providing information on:

1. The type of the water: e.g., surface water, ground water; and
2. The commonly used name and the Department's source water identification number (if any) and location of the body (or bodies) of water.

(b) If a source water assessment has been completed, the report must notify consumers of the availability of this information and the means to obtain it. In addition, the public water systems are encouraged to highlight in the report significant sources of contamination in the source water area if they have readily available information. Where a system has received a source water assessment form the Department, the report shall include a brief summary of the public water system's susceptibility to potential sources of contamination, using

language provided by the Department.

(c) Each report must include the following definitions:

1. Maximum Contaminant Level Goal or MCLG. The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

2. Maximum Contaminant Level or MCL. The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology

(d) A report for a community water system operating under a variance or an exemption issued by the Department must include the following definition:

~~1.~~ Variances and Exemptions. The Department or EPA permission not to meet an MCL or a treatment technique under certain conditions.

(e) A report that contains data on a contaminant for which the Department or EPA regulates using any of the following terms must include the applicable definitions:

1. Treatment Technique. A required process intended to reduce the level of a contaminant in drinking water.

2. Action Level. The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

3. Maximum residual disinfectant levels goal or MRDLG: The level of a drinking water disinfectant below which there is no known or expected risk to health MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

4. Maximum residual disinfectant level or MRDL: The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminant.

(f) Information on Detected Contaminants. 310 CMR 22.16A(4) specifies the requirements for information to be included in each report for contaminants subject to mandatory monitoring (except *Cryptosporidium*). It applies to:

1. Contaminants subject to an MCL, action level, maximum residual disinfectant or treatment technique (regulated contaminants);

2. Contaminants for which monitoring is required by 310 CMR 22.07C (unregulated contaminants); and

3. Disinfection by-products or microbial contaminants for which monitoring is required by 40 CFR 141.142 and 141.143, except as provided at 310 CMR 22.16A(5)(a), and which are detected in the finished water.

(g) The data relating to these contaminants must be displayed in one table or in several adjacent tables. Any additional monitoring results which a community water system chooses to include in its report must be displayed separately.

(h) The data must be derived from data collected to comply with EPA and Department monitoring and analytical requirements during calendar year 1998 for the first report and subsequent calendar years thereafter except that:

1. Where a system is allowed to monitor for regulated contaminants less often than once a year, the table(s) must include the date and results of the most recent sampling and the report must include a brief statement indicating that the data presented in the report are from the most recent testing done in accordance with the regulations. No data older than five years need be included.

2. Results of monitoring in compliance with 40 CFR 141.142 and 141.143 need only be included for five years from the date of last sample or until any of the detected

contaminants becomes regulated and subject to routine monitoring requirements, whichever comes first.

(i) For detected regulated contaminants listed in 310 CMR 22.00 and in Appendix M of the Guidelines and Policies for Public Water Systems, the table(s) must contain:

1. The MCL for that contaminant expressed as a number equal to or greater than 1.0 as provided in Appendix M of the Guidelines and Policies for Public Water Systems;
2. The MCLG for that contaminant expressed in the same units as the MCL;
3. If there is no MCL for a detected contaminant, the table must indicate that there is a treatment technique, maximum residual disinfection level, or specify the action level, applicable to that contaminant, and the report must include the definitions for treatment technique, maximum residual disinfection level and/or action level, as appropriate, specified at 310 CMR 22.16A(4)(e);
4. For contaminants subject to an MCL, except turbidity and total coliforms, the highest contaminant level used to determine compliance with 310 CMR 22.00 and the range of detected levels, as follows:
   a. When compliance with the MCL is determined annually or less frequently: the highest detected level at any sampling point and the range of detected levels expressed in the same units as the MCL.
   b. When compliance with the MCL is determined by calculating a running annual average of all samples taken at a sampling point: the highest average of any of the sampling points and the range of all sampling points expressed in the same units as the MCL.
   c. When compliance with the MCL is determined on a system-wide basis by calculating a running annual average of all samples at all sampling points: the average and range of detection expressed in the same units as the MCL.
   d. When rounding of results to determine compliance with the MCL is allowed by the 310 CMR 22.00, rounding should be done prior to multiplying the results by the factor listed in Appendix M of the Guidelines and Policies for Public Water Systems,

(20) A community water system serving fewer than 10,000 persons has the option of mailing or directly delivering copies of the consumer confidence report to each customer, as provided in 310 CMR 22.16A(14)~~(a) and (b)~~, or, alternatively, such system must comply with the following notice requirements:.

(a) Publish the report in one or more local newspapers serving the area in which the system is located;

(b) Inform the customers that the reports will not be mailed. Notification shall be either in the newspapers in which the reports are published or by a statement in a bill or newsletter; and

(c) Make the reports available to the public upon request.

(21) A community water systems serving 500 or fewer persons may forego the requirements of 310 CMR 22.16A(20), if the system provides a notice at least once per year to its customers by mail, door-to-door delivery or by posting in an appropriate location, that the report shall be available upon request.

(22) Any system subject to 310 CMR 22.16A, must retain copies of its Consumer Confidence Report for no less than three years.

(23) The Department will require non-community public water systems to comply with 310 CMR 22.16A to the extent provided in the Department's Drinking Water Guidelines and Policies, Appendix M.

(24) The Department, with EPA approval, may edit the requirements found in the Department's Drinking Water Guidelines and Policies Appendix M

(25) Consumer Confidence Report by the Department for Any Public Water System Subject to 310 CMR 22.16A. The Department may prepare and issue to the public a report as required by 310 CMR 22.16A on behalf of the public water system. The public water system remains legally responsible for ensuring that the requirements of 310 CMR 22.16A are met. The Department reserves the right to issue on behalf of the public water system the report to the public when not required by 310 CMR 22.16A in the event of a significant health problem. The public water system shall be responsible for all fees incurred by the Department as a result of issuing such report.

(26) A public water system receiving water from a source approved by the Department under an emergency agreement shall comply with 310 CMR 22.16A(4) for the emergency source unless otherwise approved in writing by the Department.

Amend Section 22.19 as follows:

22.19: Distribution System Requirements

In order to protect the distribution system of a public water system from contamination the following requirements shall be applied:

(1) All service connections shall have a minimum residual water pressure at street level of at least 20 pounds per square inch under all design conditions of flow.

(2) Water Storage Tanks: All water storage tanks used for the storage of ground or treated water which are connected to a distribution system of a public water system shall be covered and constructed and located so as to adequately protect the water from contamination. Tank vents and overflow pipes shall be properly screened to prevent contamination and not be directly connected to sanitary sewers or to storm drainage systems. Sewers, drains, standing water and similar sources of possible contamination must be kept at least 50 feet from the tank. Water main pipe, pressure tested to 50 pounds per square inch without leakage, may be used for gravity sewers at distances greater than 20 feet and less than 50 feet from said water storage tank.

(3) Storage Reservoirs: Open or uncovered earth embankment or reinforced concrete reservoirs, which are connected to a distribution system of a public water system, and used to store ground or treated water whose intended purpose is to equalize hourly and daily fluctuations of water, may continue to be used provided that said facility complies with the requirements of 310 CMR 22.20A.

(4) Construction Materials Evaluation: Community water supply systems shall identify whether the following construction materials are present in their distribution system and report to the

Department:

(a) Lead from piping, solder, caulking, interior lining of distribution mains, alloys and home plumbing
(b) Copper from piping and alloys, service lines, and home plumbing
(c) Galvanized piping, service lines, and home plumbing
(d) Ferrous piping materials such as cast iron and steel
(e) Asbestos cement pipe.

(5) Identification and Reporting of Other Materials of Construction: In addition, the Department may require identification and reporting of other materials of construction present in distribution systems that may contribute contaminants to the drinking water such as:

(a) Vinyl lined asbestos cement pipe
(b) Coal tar lined pipes and tanks

Amend Section 22.20A as follows:

22.20A: Surface Water Treatment Rule

(2) Criteria for Avoiding Filtration. A supplier of water that uses a surface water source must meet all of the conditions in 310 CMR 22.20A(2)(a) and 310 CMR 22.20A(2)(b) and is subject to 310 CMR 22.20A(2)(c) beginning June 29, 1991, unless the Department has notified it in writing that filtration is required. A supplier of water that uses a ground water source under the direct influence of surface water must meet all of the conditions in 310 CMR 22.20A(2)(a) and 310 CMR 22.20A(2)(b) and is subject to 310 CMR 22.20A(2)(c) beginning 18 months after the Department determines that it is under the direct influence of surface water, or June 29, 1991, whichever is later, unless the Department has notified it in writing that filtration is required. If the Department determines in writing, before June 29, 1991 that filtration is required, the supplier of water must have installed filtration and meet the criteria for filtered systems specified in 310 CMR 22.20A(3)(b) and 310 CMR 22.20A(4) by June 29, 1993. Within 18 months of the failure of a system using a surface water source or a ground water source under the direct influence of surface water to meet any one of the requirements in 310 CMR 22.20A(2)(a) and 310 22.20A(2)(b) or after June 29, 1993, whichever is later, the supplier of water must have installed filtration and meet the criteria for filtered systems specified in 310 CMR 22.20A(3)(b) and 310 CMR 22.20A(4).

(a) Source water quality conditions.

1. The fecal coliform concentration must be equal to or less than 20/100 ml, or the total coliform concentration must be equal to or less than 100/100 ml (measured as specified in 310 CMR 22.20A(5)(a)12. and 310 CMR 22.20A(5)(b)1. in representative samples of the source water immediately prior to the first or only point of disinfectant application in at least 90% of the measurements made for the six previous months that the system served water to the public on an ongoing basis. If a system measures both fecal and total coliform, the fecal coliform criterion, but not the total coliform criterion, in 310 CMR 22.20A(2)(a)1. must be met.

2. The turbidity level cannot exceed 1 NTU (measured as specified in 310 CMR 22.20A(5)(a)14. and 310 CMR 22.20A(5)(b)2. in representative samples of the source

water immediately prior to the first or only point of disinfectant application except that five or fewer turbidity units may be allowed if the supplier of water can demonstrate to the Department that the higher turbidity does not do any of the following:

a. Interfere with disinfection.

b. Prevent maintenance of an effective disinfectant agent throughout the distribution system; or

c. Interfere with microbiological determinations.

3. The turbidity level cannot exceed 5 NTU (at any time) unless:

a. The Department determines that any such event was caused by circumstances that were unusual and unpredictable; and

b. As a result of any such event, there have not been more than two events in the past 12 months the system served water to the public, or more than five events in the past 120 months the system served water to the public, in which the turbidity level exceeded 5 NTU. An "event" is a series of consecutive days during which at least one turbidity measurement each day exceeds 5 NTU.

(c) Treatment technique violations.

1. A supplier of water shall be deemed in violation of a treatment technique requirement if it:

a. fails to meet any one of the criteria in 310 CMR 22.20A(2)(a) or 310 CMR 22.20A(2)(b) and/or which the Department has notified in writing that filtration is required or

b. fails to install filtration by the date specified in 310 CMR 22.20A(2).

2. A supplier of water that has not installed filtration is in violation of a treatment technique requirement if:

a. the turbidity level (measured as specified in 310 CMR 22.20A(5)(a)14 and 310 CMR 22.20A(5)(b)2.) in a representative sample of the source water immediately prior to the first or only point of disinfection exceeds 1 NTU unless five or fewer NTU units have been allowed by the Department, or

b. its system is identified as a source of a waterborne disease outbreak.

(3) Disinfection. A supplier of water that uses a surface water source and does not provide filtration treatment must provide the disinfection treatment specified in 310 CMR 22.20A(3)(a) beginning December 29, 1991, unless the Department notifies it in writing that filtration is required. A supplier of water that uses a ground water source under the direct influence of surface water and does not provide filtration treatment must provide disinfection treatment specified in 310 CMR 22.20A(3)(a) beginning December 29, 1991, or 18 months after the Department determines that the ground water source is under the influence of surface water, whichever is later, unless the Department has notified it in writing that filtration is required. If the Department has determined that filtration is required, the supplier of water must comply with any interim disinfection requirements the Department deems necessary before filtration is installed. A supplier of water that uses a surface water source that provides filtration treatment must provide the disinfection treatment specified in 310 CMR 22.20A(3)(b) beginning June 29, 1993, or beginning when filtration is installed, whichever is later. A supplier of water that uses a ground water source under the direct influence of surface water and provides filtration treatment must provide disinfection treatment as specified in 310 CMR 22.20A(3)(b) by June 29, 1993, or beginning when filtration is installed, whichever is later. Failure to meet any requirement in 310 CMR 22.20A(3) after the applicable date is a treatment technique violation.

(a) Disinfection requirements for public water systems that do not provide filtration. A

supplier of water that does not provide filtration treatment must provide disinfection treatment as follows:

1. The disinfection treatment must be sufficient to ensure at least 99.9% (3-log) inactivation of *Giardia lamblia* cysts and 99.99% (4-log) inactivation of viruses, every day the system serves water to the public, except any one day each month. Each day a system serves water to the public, the supplier of water must calculate the CT value(s) from the system's treatment parameters, using the procedure specified in 310 CMR 22.20A(5)(b)3., and determine whether this value(s) is sufficient to achieve the specified inactivation rates for *giardia lamblia* cysts and viruses. If a system uses a disinfectant other than chlorine, the supplier of water may demonstrate to the Department, through the use of a Department-approved protocol for on-site disinfection challenge studies or other information satisfactory to the Department, that $CT_{99.9}$ values other than those specified in Tables 2.1-22.20A and 3.1-22.20A in 310 CMR 22.20A(5)(b)3. or other operational parameters are adequate to demonstrate that the system is achieving the minimum inactivation rates required by 310 CMR 22.20A(3)(a).
2. The disinfection system must have redundant components, including an auxiliary power supply with automatic start-up and alarm to ensure that disinfectant application is maintained continuously while water is being delivered to the distribution system unless otherwise approved by the Department.
3. The residual disinfectant concentration in the water entering the distribution system, measured as specified in 310 CMR 22.20A(5))(a)2. and 310 CMR 22.20A(5)(b)5., cannot be less than 0.2 mg/l for more than four hours.
4. The residual disinfectant concentration in the distribution system measured as free chlorine, total chlorine, combined chlorine, or chlorine dioxide, as specified in 310 CMR 22.20A(5)(a)2~~5~~. and 310 CMR 22.20A(5)(b)6., cannot be undetectable in more than 5% of the samples each month, for any two consecutive months that the system serves water to the public. Water in the distribution system with a heterotrophic bacteria concentration less than or equal to 500/ml, measured as heterotrophic plate count (HPC) as specified in 310 CMR 22.20A(5)(a)1~~3~~., is deemed to have a detectable disinfectant residual for purposes of determining compliance with this requirement. Thus, the value "V" in the following formula cannot exceed 5% in one month, for any two consecutive months.

$$V = \frac{c + d + e}{a + b} \, x \, 100$$

where:

a = number of instances where the residual disinfectant concentration is measured;
b = number of instances where the residual disinfectant concentration is not measured but heterotrophic bacteria plate count (HPC) is measured;
c = number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;
d = number of instances where residual disinfectant concentration is measured but not detected and where the HPC is >500/ml; and
e = number of instances where the residual disinfectant concentration is not measured and HPC is >500/ml.

(b) Disinfection requirements for public water systems which provide filtration. A supplier of water that provides filtration treatment must provide disinfection treatment as follows:

1. The disinfection treatment must be sufficient to ensure that the total treatment

processes of that system achieve at least 99.9% (3-log) inactivation and/or removal of *Giardia lamblia* cysts and at least 99.99% (4-log) inactivation and/or removal of viruses, as determined by the Department.

2. The residual disinfectant concentration in the water entering the distribution system, measured as specified in 310 CMR 22.20A(5)(a)2~~5~~. and 310 CMR 22.20A(5)(c)2., cannot be less than 0.2 mg/l for more than four hours.

3. The residual disinfectant concentration in the distribution system, measured as free chlorine, total chlorine, combined chlorine, or chlorine dioxide, as specified in 310 CMR 22.20A(5)(a)2~~5~~. and 310 CMR 22.20A(5)(c)3., cannot be undetectable in more than 5% of the samples each month, for any two consecutive months that the system serves water to the public. Water in the distribution system with a heterotrophic bacteria concentration less than or equal to 500/ml, measured as heterotrophic plate count (HPC) as specified in 310 CMR 22.20A(5)(a)1~~3~~., is deemed to have a detectable disinfectant residual for purposes of determining compliance with this requirement. Thus the value "V" in the following formula cannot exceed 5% in one month, for any two consecutive months.

Where a = number of instances where the residual disinfectant concentration is measured;

b = number of instances where the residual disinfectant concentration is not measured but heterotrophic bacteria plate count (HPC) is measured;

c = number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;

d = number of instances where no residual disinfectant concentration is measured but not detected and where the HPC is >500/ml; and

e = number of instances where the residual disinfectant concentration is not measured and HPC is >500/ml.

(4) Filtration. A supplier of water that uses a surface water source or a ground water source under the direct influence of surface water, and does not meet all of the criteria in 310 CMR 22.20A(2)(a) and 310 CMR 22.20A(2)(b) for avoiding filtration, must provide treatment consisting of both disinfection, as specified in 310 CMR 22.20A(3)(b), and filtration treatment which complies with the requirements of 310 CMR 22.20A(4) by June 29, 1993, or within 18 months of the failure to meet any one of the criteria for avoiding filtration in 310 CMR 22.20A(2)(a) and 310 CMR 22.20A(2)(b), whichever is later. Failure to meet any requirement of 310 CMR 22.20A after the date specified in 310 CMR 22.20A(4) is a treatment technique violation.

(a) Conventional Filtration Treatment or Direct Filtration.

1.~~1. For systems using conventional filtration or direct filtration until December 31, 2001, the turbidity level of representative samples of a system's filtered water must be less than or equal to 0.5 NTU in at least 95% of the measurements taken each month, measured as specified in 310 CMR 22.20A(5)(a)1~~4. and 310 CMR 22.20A(5)(c)1.

~~2. The turbidity level of representative samples of a system's filtered water must at no time exceed 5 NTU, measured as specified in 310 CMR 22.20A(5)(a)1~~4. and 310 CMR 22.20A(5)(c)1.

~~3.~~ Beginning January 1, 2002, systems using conventional and direct filtration treatment serving at least 10,000 people shall meet the turbidity requirements in 310 CMR 22.20D (4) and (5).

2. Beginning January 1, 2005, systems serving less than 10,000 people must meet the

turbidity requirements in 310 CMR 22.20F (6) and (7).

(b) Slow Sand Filtration.

1. For systems using slow sand filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 1 NTU in at least 95% of the measurements taken each month, measured as specified in 310 CMR 22.20A(5)(a)14. and 310 CMR 22.20A(5)(c)1.

2. The turbidity level of representative samples of a system's filtered water must at no time exceed five NTU, measured as specified in 310 CMR 22.20A(5)(a)14. and 310 CMR 22.20A(5)(c)1.

(c) Diatomaceous Earth Filtration.

1. For systems using diatomaceous earth filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to one NTU in at least 95% of the measurements taken each month, measured as specified in 310 CMR 22.20A(5)(a)1.4. and 310 CMR 22.20A(5)(c)1.

2. The turbidity level of representative samples of a system's filtered water must at no time exceed five NTU, measured as specified in 310 CMR 22.20A(5)(a)14. and 310 CMR 22.20A(5)(c)1.

(d) Other Filtration Technologies. Each supplier of water may use a filtration technology not listed in 310 CMR 22.20A(4)(a) through (c), if it demonstrates to the Department, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of 310 CMR 22.20A(3)(b), consistently achieves 99.9% removal and/or inactivation of *Giardia lamblia* cysts and 99.99% removal and/or inactivation of viruses. For a supplier of water that makes this demonstration, the requirements of 310 CMR 22.20A(3)(b) apply. Beginning January 1, 2002, a supplier of water serving at least 10,000 people shall meet the requirements for other filtration technologies as required in 310 CMR 22.20D(4)(b). Beginning January 1 , 2005, a supplier of water serving fewer than 10,000 people must meet the requirements for other filtration technologies as required in 310 CMR 22.20F(6)(c).

(5) Analytical and Monitoring Requirements

(b) Monitoring Requirements for Systems that Do Not Provide Filtration.

5. The residual disinfectant concentration of the water entering the distribution system must be monitored continuously, and the lowest value must be recorded each day, except that if there is a failure in the continuous monitoring equipment, grab sampling every four hours may be conducted in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment. Systems serving 3,300 or fewer persons may take grab samples in lieu of providing continuous monitoring on an ongoing basis at the frequencies prescribed below:

System size by population	Samples/day*
≤ 500	1
501-1,000	2
1,001-2,500	3
2,501-3,300	4

* The day's samples cannot be taken at the same time. The sampling intervals are subject to Department review and approval.

If at any time the residual disinfectant concentration falls below 0.2 mg/l in a system using grab sampling in lieu of continuous monitoring, the supplier of water must take a grab sample every four hours until the residual concentration is equal to or greater than 0.2 mg/l.

6. The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliform are sampled, as specified in 310 CMR 22.05, except that the Department may allow a supplier of water which uses both a surface water source or a ground water source under direct influence of surface water, and a ground water source, to take disinfectant residual samples at points other than the total coliform sampling points if the Department determines that such points are more representative of treated (disinfected) water quality within the distribution system.

a. Heterotrophic bacteria, measured as heterotrophic plate count (HPC) as specified in 310 CMR 22.20A(5)(a)~~3~~1., may be measured in lieu of residual disinfectant concentration.

(c) Monitoring requirements for systems using filtration treatment. A supplier of water that uses a surface water source or a ground water source under the influence of surface water and provides filtration treatment must monitor in accordance with 310 CMR 22.20A(5)(c) beginning June 29, 1993, or when filtration is installed, whichever is later.

1. Turbidity measurements as required by 310 CMR 22.20A(4) must be performed on representative samples of the system's filtered water every four hours (or more frequently) that the system serves water to the public. A supplier of water may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by the Department. For any systems using slow sand filtration, the Department may reduce the sampling frequency to no less than once per day if it determines that less frequent monitoring is sufficient to indicate effective filtration performance.

2. The residual disinfectant concentration of the water entering the distribution system must be monitored continuously, and the lowest value must be recorded each day, except that if there is a failure in the continuous monitoring equipment, grab sampling every four hours may be conducted in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment. Systems serving 3,300 or fewer persons may take grab samples in lieu of providing continuous monitoring on an ongoing basis at the frequencies each day prescribed below:

System size by population	Samples/day*
≤500	1
501-1,000	2
1,001-2,500	3
2,501-3,300	4

* The day's samples cannot be taken at the same time. The sampling intervals are subject to Department review and approval.

If at any time the residual disinfectant concentration falls below 0.2 mg/l in a system using grab sampling in lieu of continuous monitoring, the supplier of water must take a grab sample every four hours until the residual disinfectant concentration is equal to or

greater than 0.2 mg/l.

3. The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliform are sampled, as specified in 310 CMR 22.05, except that the Department may allow a supplier of water which uses both a surface water source or a ground water source under direct influence of surface water, and a ground water source to take disinfectant residual samples at points other than the total coliform sampling points if the Department determines that such points are more representative of treated (disinfected) water quality within the distribution system. Heterotrophic bacteria, measured as heterotrophic plate count (HPC) as specified in 310 CMR 22.20A(5)(a)~~3~~1., may be measured in lieu of residual disinfectant concentration.

(6) Reporting and Recordkeeping Requirements.

2. Disinfection information specified in 310 CMR 22.20A(5)(b) must be reported to the Department within ten days after the end of each month the system serves water to the public. Information that must be reported includes:

a. For each day, the lowest measurement of residual disinfectant concentration in mg/l in water entering the distribution system.

b. The date and duration of each period when the residual disinfectant concentration in water entering the distribution system fell below 0.2 mg/l and when the Department was notified of the occurrence.

c. The daily residual disinfectant concentration(s) (in mg/l) and disinfectant contact time(s) (in minutes) used for calculating the CT value(s).

d. If chlorine is used, the daily measurement(s) of pH of disinfected water following each point of chlorine disinfection.

e. The daily measurement(s) of water temperature in °C following each point of disinfection.

f. The daily CTcalc and CTcalc/$CT_{99.9}$ values for each disinfectant measurement or sequence and the sum of all CTcalc/$CT_{99.9}$ values ((CTcalc/$CT_{99.9}$)) before or at the first customer.

g. The daily determination of whether disinfection achieves adequate *Giardia* cyst and virus inactivation, i.e., whether (CTcalc/$CT_{99.9}$) is at least 1.0 or, where disinfectants other than chlorine are used, other indicator conditions that the Department determines are appropriate, are met.

h. The following information on the samples taken in the distribution system in conjunction with total coliform monitoring pursuant to 310 CMR 22.20A(3):

(i) Number of instances where the residual disinfectant concentration is measured;

(ii) Number of instances where the residual disinfectant concentration is not measured but heterotrophic bacteria plate count (HPC) is measured;

(iii) Number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;

(iv) Number of instances where the residual disinfectant concentration is measured but not detected and where residual disinfectant concentration is detected and where HPC is >500/ml;

(v) Number of instances where the residual disinfectant concentration is not measured and HPC is >500/ml;

(vi) For the current and previous month the system served water to the public, the value of "V" in the following formula:

$$V = \frac{c + d + e}{a + b} x\,100$$

where

a = the value in 310 CMR 22.20A(6)(a)2.h.(i).
b = the value in 310 CMR 22.20A(6)(a)2.h.(ii)
c = the value in 310 CMR 22.20A(6)(a)2.h.(iii)
d = the value in 310 CMR 22.20A(6)(a)2.h.(iv)
e = the value in 310 CMR 22.20A(6)(a)2.h.(v)

i. A system need not report the data listed in 310 CMR 22.20A(6)(a)2.a., and 310 CMR 22.20A(6)(a)2.c. through 310 CMR 22.20A(6)(a)2.f. if all data listed in 310 CMR 22.20A(6)2.a. through 310 CMR 22.20A(6)(a)2.f. remains on file at the system, and the Department determines that:

(i) The supplier of water has submitted to the Department all the information required by 310 CMR 22.20A(6)(a)2.a. through 310 CMR 22.20A(6)(a)2.h. for at least 12 months; and

(ii) The Department has determined that the system is not required to provide filtration treatment.

3. No later than January 10th of each year, each supplier of water must provide to the Department a report which summarizes its compliance with all watershed control program requirements specified in 310 CMR 22.20A(2)(b)5.

4. No later than January 10th of each year each system must provide to the Department a report on the on-site inspection conducted during that year pursuant to 310 CMR 22.20A(2)(b)6. unless the on-site inspection was conducted by the Department.

5. Each supplier of water, upon discovering that a waterborne disease outbreak

potentially attributable to its water system has occurred, must report that occurrence to the Department as soon as possible, but no later than by the end of the next business day.

6. If at any time the turbidity exceeds five NTU, the supplier of water must consult with the Department as soon as practical, but not later than 24 hours after the exceedance is known, in accordance with the public notification requirements under 310 CMR 22.16(3)(b)3.

7. If at any time the residual falls below 0.2 mg/l in the water entering the distribution system, the supplier of water must notify the Department as soon as possible, but no later than by the end of the next business day. The supplier of water also must notify the Department by the end of the next business day whether or not the residual was restored to at least 0.2 mg/l within four hours.

(b) A supplier of water that uses a surface water source or a ground water source under the direct influence of surface water and provides filtration treatment must report monthly to the Department the information specified in 310 CMR 22.20A(6)(b) beginning June 29, 1993, or when filtration is installed, whichever is later.

1. Turbidity measurements as required by 310 CMR 22.20A(5)(c)1. must be reported within ten days after the end of each month the system serves water to the public. Information that must be reported includes:

a. The total number of filtered water turbidity measurements taken during the month.

b. The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits specified in 310 CMR 22.20A(4) for the filtration technology being used.

c. The date and value of any turbidity measurements taken during the month which exceed five NTU.

2. Disinfection information specified in 310 CMR 22.20A(5)(c) must be reported to the Department within ten days after the end of each month the system serves water to the public. Information that must be reported includes:

a. For each day, the lowest measurement of residual disinfectant concentration in mg/l in water entering the distribution system.

b. The date and duration of each period when the residual disinfectant concentration in water entering the distribution system fell below 0.2 mg/l and when the Department was notified of the occurrence.

c. The following information on the samples taken in the distribution system in conjunction with total coliform monitoring pursuant to 310 CMR 22.20A(3):

(i) Number of instances where the residual disinfectant concentration is measured;

(ii) Number of instances where the residual disinfectant concentration is not measured but heterotrophic bacteria plate count (HPC) is measured;

(iii) Number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;

(iv) Number of instances where no residual disinfectant concentration is detected and where HPC is >500/ml;

(v) Number of instances where the residual disinfectant concentration is not measured and HPC is >500/ml;

(vi) For the current and previous month the system serves water to the public, the value of "V" in the following formula:

$$V = \frac{c + d + e}{a + b} \, x \, 100$$

where

a = the value in 310 CMR 22.20A(6)(b)2.c.(i)
b = the value in 310 CMR 22.20A(6)(b)2.c.(ii)
c = the value in 310 CMR 22.20A(6)(b)2.c.(iii)
d = the value in 310 CMR 22.20A(b)2.c.(iv)
e = the value in 310 CMR 22.20A(b)2.c.(v)

d. A supplier of water need not report the data listed in 310 CMR 22.20A(6)(b)2.a. if all data listed in 310 CMR 22.20A(6)(b)2.a. through 310 CMR 22.20A(6)(b)2.c. remains on file at the system and the Department determines that the system has submitted all the information required by 310 CMR 22.20A(6)(b)2.a. through 310 CMR 22.20A(6)(b)2.c. for at least 12 months.

3. A supplier of water, upon discovering that a waterborne disease outbreak potentially attributable to its water system has occurred, must report that occurrence to the Department as soon as possible, but no later than by the end of the next business day.

4. If at any time the turbidity exceeds five NTU, the supplier of water must consult with the Department as soon as practical, but not later than 24 hours after the exceedance is known, in accordance with the public notification requirements under 310 CMR 22.16(3)(b)3.

5. If at any time the residual falls below 0.2 mg/l in the water entering the distribution system, the supplier of water must notify the Department as soon as possible, but no later than by the end of the next business day. The system also must notify the Department by the end of the next business day whether or not the residual was restored to at least 0.2 mg/l within four hours.

Amend Section 22.20B as follows:

22.20B: Surface Water Supply Protection

(1) To protect surface waters used as sources of drinking water supply from contamination, the requirements of 310 CMR 22.20B shall apply to Zones A, B, C of a surface water source, except at:

(a) Rivers and streams designated as Class B waters pursuant to 314 CMR 4.00 which are used as drinking water sources and are not impounded at some point by means of a dam or dike to create a reservoir at which the water supply intake is located;

(b) Emergency sources approved by the Department under the provisions of M.G.L. 21G.

(2) On and after January 1, 2001, a public water system shall prohibit the following new or expanded land uses within the Zone A of its surface water sources.

(a) All underground storage tanks,

(b) Above-ground storage of liquid hazardous material as defined in M.G.L. c.21E, or liquid propane or liquid petroleum products, except as follows:

1. The storage is incidental to:

a. normal household use, outdoor maintenance, or the heating of a structure;
b. use of emergency generators;
c. a response action conducted or performed in accordance with M.G.L. c.21E and

310 CMR 40.000 and which is exempt from a ground water discharge permit
pursuant to 314 CMR 5.05(14); and

2. The storage is either in container(s) or above-ground tank(s) within a building, or
outdoors in covered container(s) or above-ground tank(s) in an area that has a containment system designed and operated to hold either 10% of the total possible storage capacity of all containers, or 110% of the largest container's storage capacity,
whichever is greater. However, these storage requirements do not apply to the replacement of existing tanks or systems for the keeping, dispensing or storing of gasoline provided the replacement is performed in accordance with applicable state and
local requirements;

(c) Treatment or disposal works subject to 314 CMR 3.00 or 5.00, except the following:

1. the replacement or repair of an existing treatment or disposal works that will not result in a design capacity greater than the design capacity of the existing treatment or disposal works;

2. treatment or disposal works for sanitary sewage if necessary to treat existing sanitary sewage discharges in non-compliance with Title 5, 310 CMR 15.000, provided the facility owner demonstrates to the Department's satisfaction that there are no feasible siting locations outside of the Zone A. Any such facility shall be permitted in accordance with 314 CMR 5.00 and shall be required to disinfect the effluent. The Department may also require the facility to provide a higher level of treatment prior to discharge;

3. treatment works approved by the Department designed for the treatment of contaminated ground or surface waters and operated in compliance with 314 CMR 5.05(3) or 5.05 (13).

4. discharge by public water system of waters incidental to water treatment processes.

(3) (a) All on-site subsurface sewage disposal systems, as defined in 310 CMR 15.000 (Title 5), within Zones A, B, and C, shall be in compliance with the requirements of 310 CMR 15.000.

(b) Within the Zone A of all surface water supplies and tributaries as defined in 310 CMR 22.02, all sewer lines and appurtenances are prohibited, except as required to eliminate existing or potential pollution to the water supply, or where the crossing of tributaries is necessary to construct a public sewer system. Where the exception is met, watertight construction of sewer lines and manholes shall be used.

(c) Within 1,000 feet of surface water supplies and tributaries, all pumping stations shall have standby power and high water alarms telemetered to an appropriate location that is manned at all times. An emergency contingency plan must be developed by the owner of the wastewater treatment facility and submitted to the Department for approval.

(d) Beyond 1,000 feet, and within the watershed of surface water supplies, the Department may in specific circumstances, after review, require additional controls when deemed necessary for protection of public health.

Amend Section 22.20F as follows:

22.20F: Long Term 1 Enhanced Surface Water Treatment Rule

(4) Disinfection Profiling.

(a) Each supplier of water, community or non-transient non-community water system, serving fewer than 10,000 people using a surface water source or ground water source under the direct influence of surface water shall develop a disinfection profile unless the Department determines that the system's profile is unnecessary. The Department may approve the use of a more representative data set for disinfection profiling than the data set required in 310 CMR 22.20F(4)(c) through 310 CMR 22.20F(4)(g).

(b) The Department may only determine that a system's profile is unnecessary if a system's TTHM and HAA5 levels are below 0.064 mg/L and 0.048 mg/L, respectively. To determine these levels, TTHM and HAA5 samples must be collected after January 1, 1998, during the month with the warmest water temperature, and at the point of maximum residence time in the distribution system.

(c) A disinfection profile shall be developed using the following three steps:

1. The supplier of water shall collect data for several parameters from the plant as required in 310 CMR 22.20F(4)(d) over the course of 12 months. If the system serves between 500 and 9,999 persons the supplier of water must begin to collect data no later than July 1, 2003. If the system serves fewer than 500 persons the supplier of water must begin to collect data no later than January 1, 2004;
2. The supplier of water shall use the data to calculate weekly log inactivation as required in 310 CMR 22.20F(4)(e) and 310 CMR 22.20F(4)(f); and
3. The supplier of water shall use these weekly log inactivations to develop a disinfection profile as specified in 310 CMR 22.20F(4)(g).

(d) The supplier of water shall monitor the following parameters to determine the total log inactivation using the analytical methods in 310 CMR 22.20A(5)(a), once per week on the same calendar day, over 12 consecutive months:

1. The temperature of the disinfected water at each residual disinfectant concentration sampling point during peak hourly flow;
2. If the system uses chlorine, the pH of the disinfected water at each residual disinfectant concentration sampling point during peak hourly flow;
3. The disinfectant contact time(s) ("T") during peak hourly flow; and
4. The residual disinfectant concentration(s) ("C") of the water before or at the first customer and prior to each additional point of disinfection during peak hourly flow.

(e) Use the tables in 310 CMR 22.20A (5)(b) 3.e. to determine the appropriate $CT_{99.9}$ value. The supplier of water shall calculate the total inactivation ratio as follows, and multiply the value by 3.0 to determine the log inactivation of *Giardia lamblia*:

1. If the supplier of water uses only one point of disinfectant application, the supplier of water shall determine the total inactivation ratio for the disinfection segment based on either of the following methods:
   a. Determine one inactivation ratio ($CTcalc/CT_{99.9}$) before or at the first customer during peak hourly flow; or
   b. Determine successive $CTcalc/CT_{99.9}$ values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first

customer during peak hourly flow. Under this alternative, the system must calculate the total inactivation ratio by determining ($CT_{calc}/CT_{99.9}$) for each sequence and then

add the ($CTcalc/CT_{99.9}$) values together to determine ($3CTcalc/CT_{99.9}$).

2. If the supplier of water uses more than one point of disinfectant application before the first customer, the supplier of water shall determine the ($CTcalc/CT_{99.9}$) value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow using the procedure specified in 310 CMR 22.20F(4)(e)1.b.

(f) If the supplier of water uses chloramines, ozone, or chlorine dioxide for primary disinfection, the supplier of water shall also calculate the logs of inactivation for viruses and develop an additional disinfection profile for viruses using methods approved by the Department.

(g) Each supplier of water will use each log inactivation as a data point in the disinfection profile. The supplier of water will have obtained 52 measurements (one for every week of the year). This will allow the supplier of water and the Department the opportunity to evaluate how microbial inactivation varied over the course of the year by looking at all 52 measurements (the Disinfection Profile). The supplier of water shall retain the Disinfection Profile data in graphic form, such as a spreadsheet, which must be available for review by the Department as part of a sanitary survey. The supplier of water shall use this data to calculate a benchmark if they are considering changes to disinfection practices.

(6) Combined Filter Effluent Requirements.

(a) Each supplier of water that serves fewer than 10,000 people using a surface water source or ground water source under the direct influence of surface water is required to filter, and each supplier of water that utilizes filtration other than slow sand filtration or diatomaceous earth filtration shall meet the combined filter effluent (CFE) turbidity requirements of 310 CMR 22.20F(6)(b) through 310 CMR 22.20F(6)(d). If the supplier of water uses slow sand or diatomaceous earth filtration the supplier of water is not required to meet the CFE turbidity limits of 310 CMR 22.20F, but such supplier of water shall continue to meet the CFE turbidity limits in 310 CMR 22.20A(4).

(b) Each supplier of water that serves fewer than 10,000 people using a surface water source or ground water source under the direct influence of surface water is required to filter, and each supplier of water that utilizes filtration other than slow sand filtration or diatomaceous earth filtration shall meet two strengthened CFE turbidity limits as follows:

1. The first CFE turbidity limit is a "95th percentile" turbidity limit that the system shall meet in at least 95% of the turbidity measurements taken each month. Measurements must continue to be taken as described in 310 CMR 22.20A(5)(b)1. and 310 CMR 22.20A(5)(b)3. Monthly reporting shall be completed according to 310 CMR 22.20F(8).

   a. If the supplier of water uses conventional filtration or direct filtration, the turbidity level of representative samples of a system's filtered water shall be less than or equal to 0.3 NTU in at least 95% of the measurements taken each month, measured as specified in 310 CMR 22.20A(5)(a) and 310 CMR 22.20A(5) (c).

   b. If the supplier of water uses "alternative" filtration" the turbidity level of representative samples of the system's filtered water shall be less than or equal to 0.3 NTU in at least 95% of the measurements taken each month, measured as specified in 310 CMR 22.20A(5)(a) and 310 CMR 22.20A(5)(c).

2. The second CFE turbidity limit is a "maximum" turbidity limit that the system may not exceed at any time during the month. Measurements shall continue to be taken as

described in 310 CMR 22.20A(5)(b)1. and 3. Monthly reporting shall be completed according to 310 CMR 22.20F(8)(a). The following is a description of the required limits for specific filtration technologies:

a. If the supplier of water uses conventional filtration or direct filtration, the "maximum" turbidity level is 1 NTU.

b. If the supplier of water uses "alternative" filtration" the "maximum" turbidity level is 1 NTU.

(c) Each supplier of water that serves fewer than 10,000 people using a surface water source or ground water source under the direct influence of surface water that uses a system that consists of alternative filtration (filtration other than slow sand filtration, diatomaceous earth filtration, conventional filtration, or direct filtration) is required to conduct a demonstration. The supplier of water shall demonstrate to the Department, using pilot plant studies or other means, that the system's filtration, in combination with disinfection treatment, consistently achieves:

1. 99% removal of *Cryptosporidium* oocysts;
2. 99.9% removal and/or inactivation of *Giardia lamblia* cysts; and
3. 99.99% removal and/or inactivation of viruses.

(d) Each supplier of water serving fewer than 10,000 people using a surface water source or ground water source under the direct influence of surface water that practices lime softening, may acidify representative CFE turbidity samples prior to analysis using a protocol approved by the Department.

(7) Individual Filter Turbidity Requirements.

(a) Each supplier of water serving fewer than 10,000 people using a surface water source or ground water source under the direct influence of surface water that utilizes conventional filtration or direct filtration, shall conduct continuous monitoring of turbidity for each individual filter at the filtration facility. The following requirements apply to continuous turbidity monitoring:

1. Monitoring must be conducted using an approved method in 310 CMR 22.20A(5)(a);
2. Calibration of turbidimeters shall be conducted using procedures specified by the manufacturer;
3. Results of turbidity monitoring shall be recorded at least every 15 minutes;
4. Monthly reporting must be completed according to 310 CMR 22.20F(8)(a); and,
5. Records shall be maintained according to 310 CMR 22.20F(8)(b).

(b) If there is a failure in the continuous turbidity monitoring equipment, the supplier of water shall conduct grab sampling every four hours in lieu of continuous monitoring until the turbidimeter is back on-line. The system has 14 days to resume continuous monitoring before a violation is incurred.

(c) If the system only consists of one or two, the supplier of water may conduct continuous monitoring of the CFE turbidity in lieu of individual filter effluent turbidity monitoring. Continuous monitoring shall meet the same requirements set forth in 310 CMR 22.20F(7)(a)1. through 310 CMR 22.20F(7)(a)4. and 310 CMR 22.20F(7)(b).

(d) If the supplier of water conducts continuous turbidity monitoring, follow-up action is required as follows:

1. If the turbidity of an individual filter or the turbidity of the CFE for systems with two filters that monitor CFE in lieu of individual filters exceeds 1.0 NTU in two consecutive recordings 15 minutes apart, the supplier of water shall report to the Department by the

10th day of the following month and include the filter number(s), corresponding date(s), turbidity value(s) which exceeded 1.0 NTU, and the cause (if known) for the exceedance(s).

2. If the supplier of water was required to report to the Department for three months in a row and turbidity exceeded 1.0 NTU in two consecutive recordings 15 minutes apart at the same filter or CFE for systems with two filters that monitor CFE in lieu of individual filters, the supplier of water shall conduct a self-assessment of the filter(s) within 14 days of the day the filter exceeded 1.0 NTU in two consecutive measurements for the third straight month unless a Comprehensive Performance Evaluation (CPE) as specified in 310 CMR 22.20F(7)(d)3. was required. Systems with two filters that monitor CFE in lieu of individual filters shall conduct a self-assessment on both filters. The self-assessment must consist of at least the following components: assessment of filter performance; development of a filter profile; identification and prioritization of factors limiting filter performance; assessment of the applicability of corrections; and preparation of a filter self-assessment report. If a self-assessment is required, the date that it was triggered and the date that it was completed shall be included.

3. If the supplier of water was required to report to the Department for two months in a row and turbidity exceeded 2.0 NTU in two consecutive recordings 15 minutes apart at the same filter or CFE for systems with two filters that monitor CFE in lieu of individual filters, the supplier of water shall arrange to have a CPE conducted by the Department no later than 60 days following the day the filter exceeded 2.0 NTU in two consecutive measurements for the second straight month. If a CPE has been completed by the Department within the 12 prior months or the supplier of water and the Department are jointly participating in an ongoing Comprehensive Technical Assistance (CTA) project at the system, a new CPE is not required. If conducted, a CPE must be completed and submitted to the Department no later than 120 days following the day the filter exceeded 2.0 NTU in two consecutive measurements for the second straight month.

(e) If the supplier of water practices lime softening, the supplier of water may apply to the Department for alternative turbidity exceedance levels for the levels specified in 310 CMR 22.20F(7)(d). The supplier of water shall be able to demonstrate to the Department that higher turbidity levels are due to lime carryover only, and not due to degraded filter performance.

(8) Reporting and Recordkeeping.

(a) In addition to the reporting and recordkeeping requirements in 310 CMR 22.20A, each supplier of water who is subject to the requirements of 310 CMR 22.20F shall report the following information to the Department at the frequency specified, if the supplier of water is subject to the specific requirement.

1. Combined filter requirements that shall be reported within ten days after the end of each month shall include:

a. The total number of filtered water turbidity measurements taken during the month.

b. The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits specified in 310 CMR 22.20F(7).

c. The date and value of any turbidity measurements taken during the month which

exceed 1.0 NTU for systems using conventional filtration treatment or direct filtration, or exceed the maximum level set by the Department 310 CMR 22.20F(7).

2. The individual turbidity requirements that shall be reported within ten days after the end of each month, except as otherwise provided in 310 CMR 22.20F(8)2.c. and 310 CMR 22.20F(8)2.e., shall include:

a. That the supplier of water conducted individual filter turbidity monitoring during the month.

b. The filter number(s), corresponding date(s), and turbidity value(s) that exceeded 1.0 NTU during the month, and the cause (if known) for the exceedance(s) but only in if two consecutive measurements exceeded 1.0 NTU.

c. If a self-assessment is required, the date that it was triggered and the date that it was completed. If the self-assessment was triggered during the last four days of the month, the date that it was triggered and the date that it was completed shall be reported within 14 days after the date the self-assessment was triggered.

d. If a CPE is required and the date that it was triggered.

e. Copy of completed CPE report within 120 days after the CPE was triggered.

3. Disinfection Profiling shall include:

a. Results of optional monitoring that show TTHM levels <0.064 mg/l and HAA5 levels <0.048 mg/l (only if the system wishes to forgo profiling) or that the system has begun disinfection profiling.

i. For systems serving 500–9,999 by July 1, 2003

ii. For systems serving fewer than 500 by January 1, 2004.

4. Disinfection Benchmarking shall include: A description of the proposed change in disinfection, the system's disinfection profile for *Giardia lamblia* (and, if necessary, viruses) and disinfection benchmark, and an analysis of how the proposed change will affect the current levels of disinfection anytime a significant change in disinfection practices is being considered.

(b) Each supplier of water who is subject to the requirements of 310 CMR 22.20F shall, in addition to recordkeeping requirements under 310 CMR 22.20A(6), maintain records in accordance with 310 CMR 22.17(12).

Amend Section 22.21 as follows:

22.21: Groundwater Supply Protection

(2) Wellhead Protection Zoning and Nonzoning Controls

(a) Wellhead protection zoning and nonzoning controls submitted to the Department in accordance with 310 CMR 22.21(1), shall collectively prohibit the siting of the following land uses within the Zone II, or Zone III if the criteria of 310 CMR 22.21(1)(f) have been met, of the proposed well, wellfield, or spring, whichever is applicable:

1. landfills and open dumps, as defined in 310 CMR 19.006;

2. landfills receiving only wastewater residuals and/or septage (wastewater residuals "monofills") approved by the Department pursuant to M.G.L. c. 21, § 26 through 53; M.G.L. c. 111, § 17; M.G.L. c. 83, §§ 6 and 7, and any regulations promulgated thereunder.

3. automobile graveyards and junkyard, as defined in M.G.L. c. 140B, § 1;

4. stockpiling and disposal of snow or ice removed from highways and streets located outside of Zone II that contains sodium chloride, chemically treated abrasives or other chemicals used for snow and ice removal;

5. petroleum, fuel oil and heating oil bulk stations and terminals, including, but not limited to, those listed under Standard Industrial Classification (SIC) Codes 5171 (not including liquified petroleum gas) and 5983. SIC Codes are established by the U.S. Office of Management and Budget and may be determined by referring to the publication, Standard Industrial Classification Manual and any subsequent amendments thereto;

6. treatment or disposal works subject to 314 CMR 5.00 for wastewater other than sanitary sewage. This prohibition includes, but is not limited to, treatment or disposal works related to activities under the Standard Industrial Classification (SIC) Codes set forth in 310 CMR 15.004(6) (Title 5), except the following:

a. the replacement or repair of an existing system(s) that will not result in a design capacity greater than the design capacity of the existing system(s); and

b. treatment works approved by the Department designed for the treatment of contaminated ground or surface waters and operated in compliance with 314 CMR 5.05(3) or 5.05 (13); and

c. publicly owned treatment works, or POTWs.

7. facilities that generate, treat, store or dispose of hazardous waste that are subject to M.G.L. c. 21C and 310 CMR 30.000, except for the following:

a. very small quantity generators, as defined by 310 CMR 30.00;

b. household hazardous waste collection centers or events operated pursuant to 310 CMR 30.390;

c. waste oil retention facilities required by M.G.L. c. 21, § 52A; and

d. treatment works approved by the Department designed in accordance with 314 CMR 5.00 for the treatment of contaminated ground or surface waters.

8. any floor drainage systems in existing facilities, in industrial or commercial hazardous material and/or hazardous waste process areas or storage areas, which discharge to the ground without a DEP permit or authorization. Any existing facility with such a drainage system shall be required to either seal the floor drain (in accordance with the state plumbing code, 248 CMR ~~2.00~~ 10.00), connect the drain to a municipal sewer system (with all appropriate permits and pre-treatment), or connect the drain to a holding tank meeting the requirements of all appropriate DEP regulations and policies

Amend Section 22.22 as follows:

22.22: Cross Connections Distribution System Protection

(11) Installation Requirements.

(a) Reduced Pressure Backflow Preventers: Reduced pressure backflow preventers may be used to protect against backflow caused by back pressure or back siphonage and to protect a public water supply system from substances which are hazardous to health only when they are installed in the following manner:

1. For devices installed as in-plant protection, the reduced pressure backflow preventer shall be installed on the owner's side of the water meter on the potable water supply line.

2. Before installing a reduced pressure backflow preventer, all pipelines shall be thoroughly flushed to remove foreign material.

3. Drinking and domestic water lines, lines for safety showers, and lines for eye wash units must be taken off the upstream side of reduced pressure backflow preventers for devices installed as in-plant protection.

4. The reduced pressure backflow preventer shall be located so as to permit easy access and provide adequate and convenient space for maintenance, inspection, and testing.

5. The owner of the device shall be able to shut down water lines after reasonable notice during normal business hours to permit necessary testing and maintenance of the device, provided that if it is not possible to meet this requirement a by-pass line equipped with an approved type reduced pressure backflow preventer shall be installed.

6. The reduced pressure backflow preventer and shut-off valves must be installed in a horizontal alignment between three and four feet from the floor to the bottom of the device and a minimum of 12 inches from any wall. Vertical installation of devices shall be determined by the public water system.

7. Tightly closing valves must be installed at each end of the device and be immediately accessible unless otherwise approved by the Department or its Designee or public water system.

8. The device must be protected from freezing, flooding, and mechanical damage.

9. If the device is to be installed on a hot water line, a device approved for use at the elevated temperature must be used.

10. If a drain is to be provided for the relief valve port, there must be an approved air gap separation between the port and drain line. To be approved, the air gap must be at least twice the internal diameter of the discharge line.

11. Pit installation shall be approved only as provided in 310 CMR 22.22(11)(f).

12. All water lines shall be color coded according to the state plumbing code, except that water filtration plants, pumping stations, sewage treatment plants and sewage pumping stations shall label all water lines in lieu of color coding.

(b) Double Check Valve Assemblies: Double check valve assemblies may be used to protect against backflow caused by back pressure or back siphonage and to protect a public water supply system from substances which may be objectionable, but not hazardous to health, only if they are installed in the following manner:

1. Drinking and domestic water lines, lines for safety showers, and lines for eye wash units must be taken off the upstream side of the double check valve assembly for devices installed as in-plant protection.

2. The double check valve assembly shall be installed with adequate space to facilitate maintenance, inspection, and testing.

3. The double check valve must be installed horizontally and the top of the double check valve assembly must be between 12 inches and 48 inches from the floor ~~to the bottom of the device~~ and a minimum of 12 inches from any wall. Vertical installation of devices shall be determined by the public water system.

4. If a water meter is not provided on the upstream side of an approved swing-type double check valve assembly, a three to five foot spacer must be installed between the check valves.

5. Tightly closing valves must be installed at each end of the device and be immediately accessible unless otherwise approved by the Department or its Designee.

6. Double check valve assemblies must be readily accessible for testing and service and provided with suitable connections and appurtenances for testing.

7. The device must be protected against flooding, freezing and mechanical damage.

8. Pit installation will be approved only as provided in 310 CMR 22.22(11)(f).

(15) Fees.

(a) The certification fees for Backflow Prevention Device Testers and Cross Connection Control Surveyors are established by the Department as stated in 310 CMR 4.00.

(b) A person holding either a Testers or Surveyors certificate will not be charged an additional fee for a combination certification provided that all the requirement of 310 CMR 22.~~0~~22(12)~~8~~ have been met.

(c) Permit fees as specified at 310 CMR 22.22(7)(b) are established by the Department in accordance with 310 CMR 4.00.